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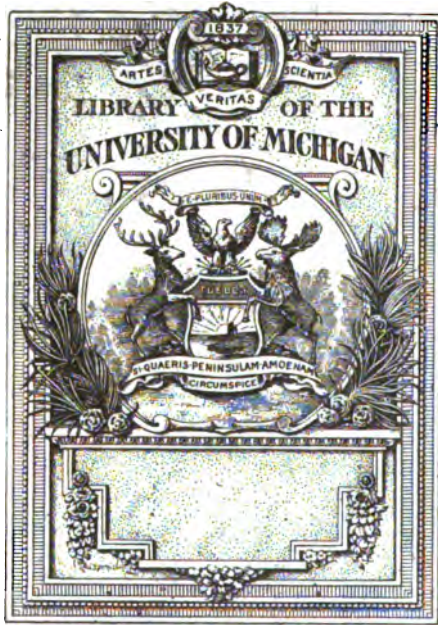
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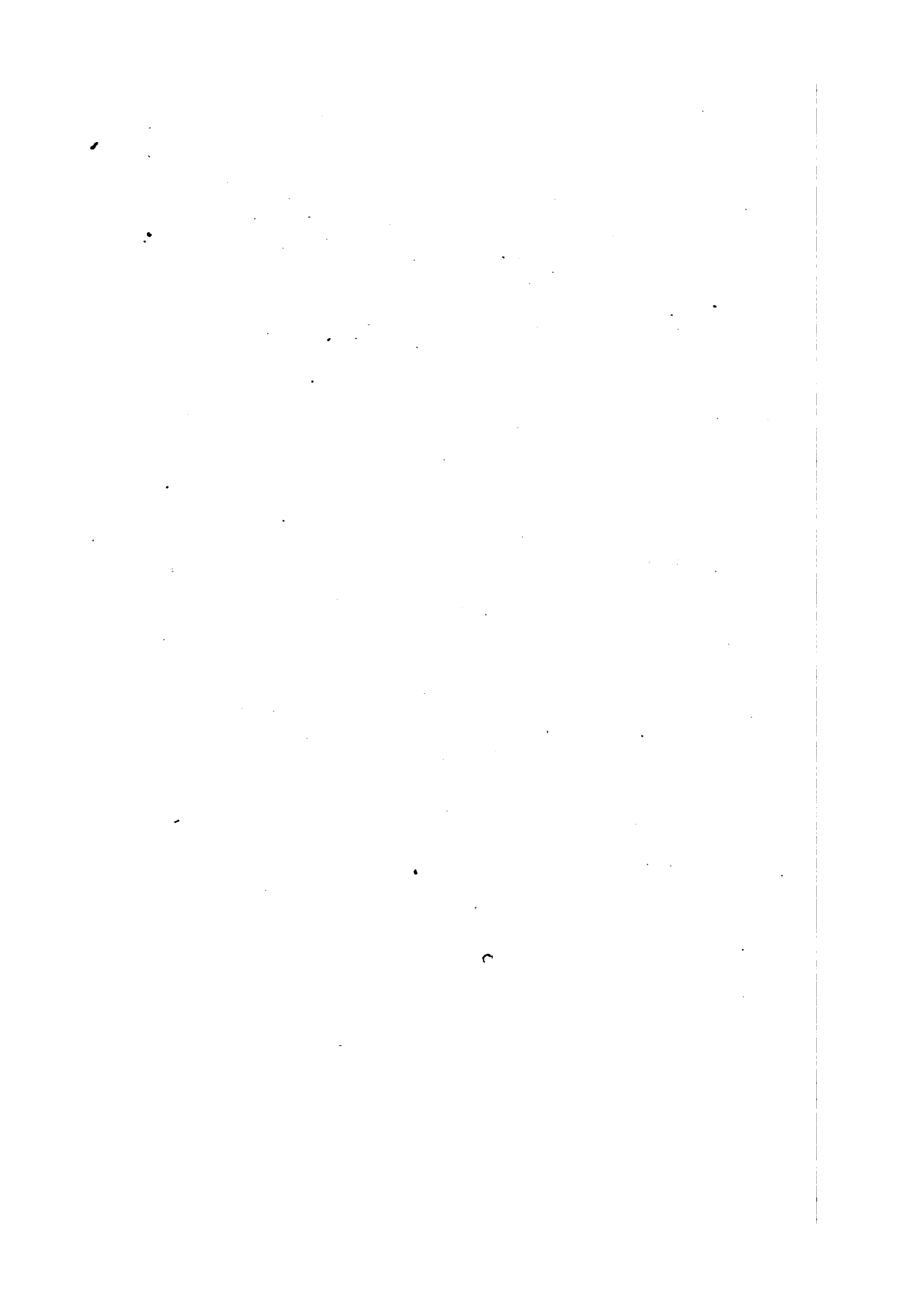
1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text notes that without clear records, it becomes difficult to track expenses, revenues, and other critical data points over time.

2. The second section addresses the challenges associated with data collection and analysis. It highlights that gathering large volumes of data can be a complex and time-consuming process. However, once collected, this data provides valuable insights into trends, patterns, and potential areas for improvement. The document suggests that investing in robust data management systems can significantly streamline these processes.

3. The third part of the document focuses on the role of technology in modern operations. It discusses how various software solutions, such as CRM, ERP, and data analytics tools, can enhance efficiency and productivity. The text argues that while technology may require an initial investment, the long-term benefits in terms of cost reduction and performance optimization are substantial.

4. The fourth section explores the importance of human resources and training. It states that even the most advanced technology is only as good as the people using it. Therefore, providing ongoing training and development opportunities for employees is crucial to ensure they are equipped with the necessary skills to leverage technology effectively.

5. The final part of the document concludes by summarizing the key takeaways and offering recommendations for future actions. It reiterates that a combination of accurate record-keeping, effective data management, strategic technology use, and a well-trained workforce is essential for achieving long-term success and growth in any organization.



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ABIES DOUGLASII,

DROPMORE.

TREES & SHRUBS

FOR

ENGLISH PLANTATIONS:

*A SELECTION AND DESCRIPTION OF THE MOST
ORNAMENTAL TREES AND SHRUBS, NATIVE AND FOREIGN,
WHICH WILL FLOURISH IN THE OPEN AIR IN
OUR CLIMATE;*

WITH CLASSIFIED LISTS OF THE SEVERAL SPECIES, UNDER THE HEADS OF SIZE
AND HABIT, PECULIARITIES OF FOLIAGE AND FLOWERS, SEASON OF
BLOOMING, SOILS, SITUATION, ETC., FOR THE PURPOSES OF
PRACTICAL APPLICATION.

BY AUGUSTUS MONGREDIEN.

PRÆDISCERE
CURA SIT
ET QUID QUÆQUE FERAT REGIO, ET QUID QUÆQUE RECUSET.
VIRGIL, *Georgic. Lib. 1.*

With Illustrations.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.

1870.

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PREFACE.

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THE primary object of this work is to furnish information which may induce and enable that numerous and increasing class of persons who are fond of arboriculture, and who take an interest in the formation or improvement of shrubberies, plantations, and parks, to avail themselves of all the resources at their command. Of the vast extent of those resources they are mostly unaware. Few know—whilst all might, and ought to know—that there are upwards of 600 trees and shrubs of surpassing beauty, each pre-eminent for various merits of its own, as regards foliage, flower, fruit, aspect, etc., that will grow in this country in the open air.

These afford materials for grouping, with a view to effect, which have never been utilised to nearly the extent of which they are susceptible. Like the colours on a painter's palette, by the selection and combination of which he makes his canvas glow with beautiful forms and harmonious tints, so the infinite variety of outline and colour in trees affords scope for so arranging them as to produce most striking results, both in home views and distant landscapes.

1836

To facilitate so desirable a result, the plants described in the first part of this work, have, in the second part, been distributed into a variety of groups according to the many different points of view in which they present themselves in reference to the special purposes of the planter.

The 621 species described in this volume have been carefully selected from the large multitude which, from time to time, have been introduced from all parts of the world, and of which the vast majority are not worth cultivation for ornamental purposes. The task of selection cannot be deemed an easy or unimportant one, as it implies a knowledge of the respective merits both of the discarded and the selected species. The writer's competency to perform this work must be judged by the result; but it may be permissible in him to state that he brings to it the following qualifications. He has made the arboricultural branch of botanical science a special study for many years; he possesses in his own grounds specimens of nearly all the species he has described; and in most cases his descriptions are based on his personal examination of the living plants.

HEATHERSIDE,

BAGSHOT, SURREY,

January 1870.

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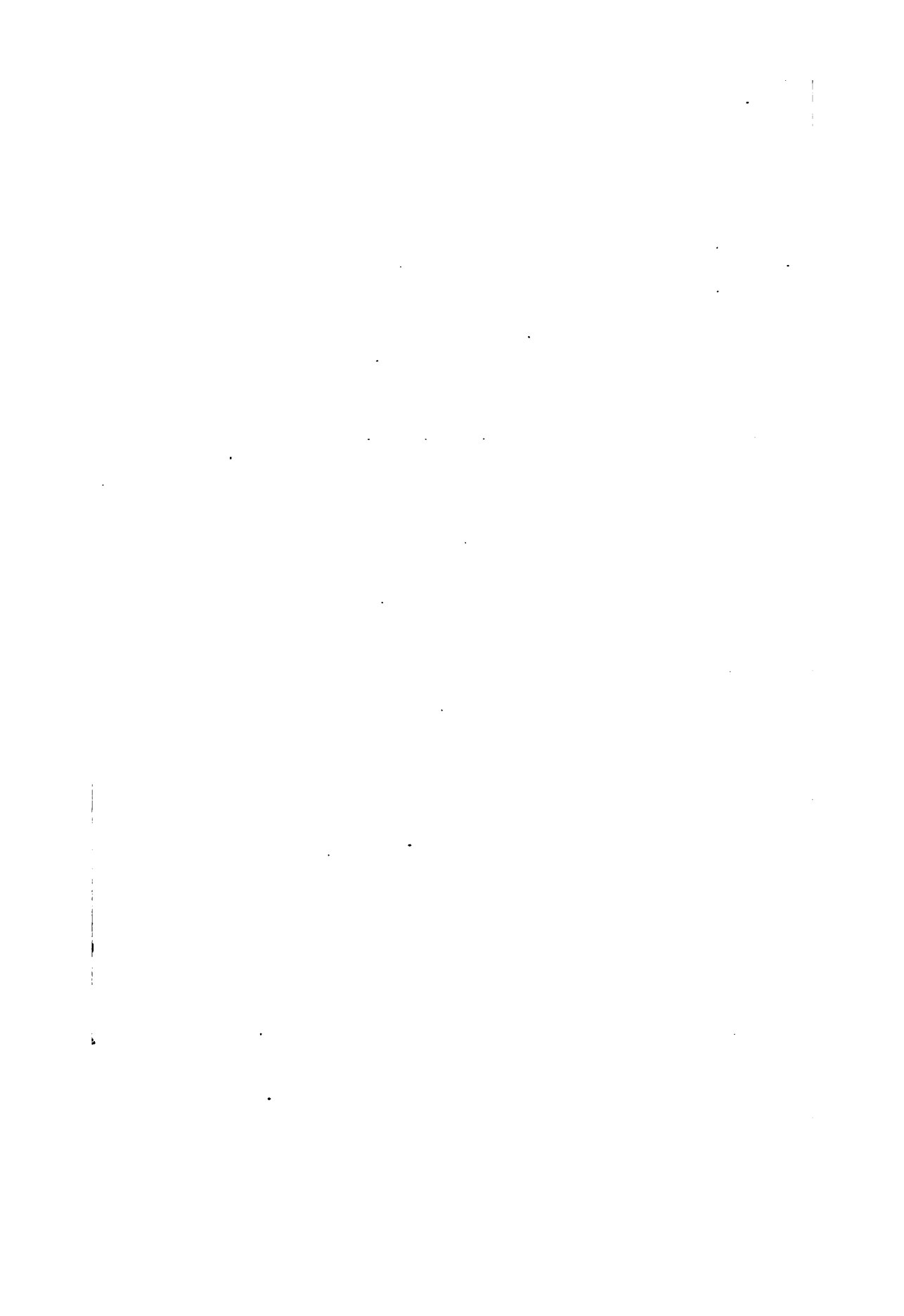
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ABIES PICEA—Silver Fir.

INTRODUCTION.

THE English are a nature-loving, a country-loving, and therefore a plant-loving people. Densely populated as the land has become, a very large proportion of its inhabitants reside either permanently or mostly in or near towns; but their love of nature is not thereby extinguished. Far from it; it glows intensely in the heart of the town-dweller. Hence his frequent migrations when he can tear himself away from his town pursuits,—hence the innumerable suburban villas that fringe the circuit of all large cities,—hence the amateur farming (sometimes a costly amusement),—hence the parks of the wealthy, and the window-pot culture of the poor. The area of land devoted to gardens and ornamental plantations in England is considerably larger, in proportion to that devoted to reproductive cultivation, than in any other country in the world. The beautiful encroaches largely on the domain of the useful. And

as we increase in population, wealth, and refinement, the necessity for, means for, and taste for rural recreations must still grow.

But while no expense is spared by the lovers of nature to adorn their gardens, it is surprising how little they have availed themselves of the lavish stores which nature has provided. A very large number of trees and plants, inhabitants of various parts of the globe, are capable of flourishing in our climate, without protection, quite or nearly as well as in their native habitats. Nearly all the finest of these have already been introduced into this country, partly by botanists and travellers, but mostly by practical gardeners sent out by, and at the expense of, enterprising nurserymen and horticulturists. These beautiful productions of nature are, therefore, procurable here in almost endless variety, and, by the art of scientific growers, have been so multiplied that the cost of most of them has become insignificant. Some of these foreign trees and shrubs are conspicuous for the beauty of their flowers, some for the elegance of their foliage, some for their gigantic growth and majestic aspect, and there are few indeed which do not present some claim to notice, if not to admiration. Supposing these to be freely planted and distributed over the face of the country, interspersed with our own old favourite oaks and elms, what fresh charms would they not lend to our landscapes! What contrasts, what variety, what new tints, what botanical interest, would result from so large an addition to our old plantations! Every private garden would, in like manner, were these vegetable treasures utilised, receive a large accession of beauty, variety, and suggestive interest. The novelty and beauty of such plants, and their diversity from common forms, would give increased zest to the horticultural tastes of the possessor. He would watch their growth, study their habits, and speculate on their ultimate aspect after full development and maturity, with far greater interest than he now feels in the old and well-known denizens

of his grounds. Their names, native countries, uses and peculiarities, date and mode of introduction, the rate of growth of his specimens as compared with others, etc., would become to him materials for inquiry, observation, and reflection. Happy the man who, lured step by step into further researches, yields himself up to the beneficent fascination of such studies !

Although there are, of course, many exceptions, yet as a rule, our shrubberies at present consist chiefly of a very limited number of species, most of which were known to and cultivated by our ancestors ; and, as all plantations now contain pretty nearly the same trees and shrubs, the result is, that all the beauty they may boast of (and that is much, although it might be more) cannot redeem them from the charge of monotony. Common forest-trees for belts—the Almond, Laburnum, Hawthorn, and Lilac, as flowering trees ; the Laurel, Laurestine, and Aucuba, for evergreens ; the Rose, Rhododendron, and Azalea, for flowering shrubs ; the Ivy, American Creeper, and Wistaria, for climbers ;—in these consists, so far as trees and shrubs are concerned, the poverty-stricken bill of fare of the vast majority of our gardens. To these might be added several hundreds of trees and shrubs, which would thrive as well, and afford at least as much ornament, with infinitely greater variety. How is it that we are so “cribbed, cabined, and confined,” and limit ourselves to the “*toujours perdrix*” of a few old species ? The reasons are many. Some persons are indifferent,—some are not aware of the profusion of novel forms of beauty accessible to them,—many are aware of it, but are deterred by erroneous notions of the expense and difficulty of procuring them ; but most numerous of all are they who, whilst they would be only too glad to adorn their grounds with a large variety of fine plants, are without any guide to the selection of the species best suited to their respective requirements. It is useless for them to consult that magnificent work of the enthusiastic and

indefatigable Loudon, the *Arboretum et Fruticetum Britannicum*. Most amateurs are more bewildered than enlightened by a reference to its pages. How can they make a proper selection out of that enormous list of *all* the hardy trees and shrubs (without reference to merit) introduced into Great Britain up to Loudon's time? How can they (even had they time and patience to study those four dense volumes) distinguish those which would answer their purposes from the vast number which would not? And yet in a botanical work like Loudon's, professing completeness, the latter have an equal claim to insertion with the most eligible. To this may be added, that since the publication of that work, many very desirable species have been introduced. The only other sources of information are gardening works and nurserymen's catalogues, in most of which there is nearly the same absence of selection as in Loudon's work, with the additional defect of their being destitute of any descriptive remarks. It is to furnish the assistance required, but hitherto unsupplied, that the present work is written.

Some portion of the merit to which this work may lay claim consists in the selection and arrangement of materials already existing to some extent in other works. But it is fair to state that, interspersed throughout, there is a large contribution of original matter—the result of many years' personal experience and observation. Of course, as regards the general run of old plants, the descriptions given in this work cannot but be nearly identical with those given by earlier writers; but it must be remembered that during the last twenty years, a great number of beautiful trees and shrubs, especially amongst the coniferous tribes, have been introduced into England. China and Japan on the one hand, and the extensive regions lying to the west of the Rocky Mountains in North America on the other, have yielded a rich supply of plants as strikingly new as they are beautiful, and possessing the inestimable

advantage of thriving in our soil and climate. This large addition to our shrubberies and plantations has not yet been chronicled and described, and what information has been hitherto obtained as to each species is sparingly scattered through a number of works in various languages. Of the newly introduced species included in this work, the great majority have been described from the writer's own observation and investigations. Add to which, that the task of selection from amongst the older species is of itself in one sense an original work. The peculiar claims of each species to preference over its congeners could only be recognised and pointed out by those who, through experiment and study, have become acquainted with their respective individual merits.

The labours of such men as Douglas, Murray, Fortune, Veitch, and a host of others, have now ransacked the largest portions of those countries with which our climatic conditions sufficiently assimilate to allow their plants to thrive with us in the open air. The inter-tropical regions still teem with undiscovered and undescribed species; but the present work only deals with hardy trees and shrubs, and of such, but few can now remain unknown after the thorough exploration that has been made throughout the temperate and quasi-temperate zones. The present work will therefore approach to a completeness that was wholly impossible but a few years since.

The plan of alphabetical distribution of the genera was adopted as the easiest of reference, whilst for those who might desire to take a general view of the distribution of the genera into their natural orders, a tabular synopsis will be found exhibiting them under that aspect.

The first part of the work consists of a descriptive list of all the species which the writer has deemed most worthy of general cultivation in ornamental shrubberies and plantations. The term Shrub comprises all ligneous (or wood-bearing) plants, however minute their size. No less than

621 species are here presented as having claims to notice ; but large as is that number, it forms but a small proportion of the vast host from which the selection is made. The remainder consists chiefly of species which are *comparatively* devoid of merit, but partly of species so nearly allied to those selected as to preclude the necessity for possessing both. From the 621 species noticed, the amateur, guided by the descriptions given, can frame a collection more or less varied and extensive, according to the space he may have disposable, to the nature of the climate, soil, and exposure, and to the configuration of his grounds.

The second part of the work comprises a distribution of all the species described in the first part under different heads, such as size, shape, mode of growth, etc. etc. This mode of classification presents the various groups in their relation to the requirements of the horticulturist, so that, given the conditions under which the planting operations are to be performed, a selection of those species best adapted to them becomes easy. The information afforded will not only be useful for the stocking of gardens, large or small, but also for the decoration of parks and plantations, and even for the choice of trees intended for woods and forests on a large scale. Nature has fitted certain plants for thriving under peculiar conditions, and, on the other hand, has left but few spots on earth unfitted for at least some kind of vegetation. It is for man, studying the intents and purposes of nature, to discover the art of placing the right tree in the right place.

Some few species are included in the list which are not perfectly hardy, and for which some protection is required against very cold weather or very violent winds. But most of these plants possess attractions which fully repay both the slight trouble which such shelter implies, and the risk there may be of their being killed in spite of such precautions. There are found to be considerable variations between indi-

viduals of the same species as regards the power of resisting cold ; and, moreover, the measure of that resistance depends upon several varying circumstances, such as the constitution of the soil, the height of the locality above the level of the sea, the degree of humidity prevailing in both the air and the soil, and the relative shelter or exposure to which they are subjected. Experience has shown that tender plants are more liable to casualties when grown in damp and sheltered valleys than when cultivated in high and more exposed situations. Under the former circumstances, their growth is very luxuriant ; but its development early in spring exposes the shoots to be cut off by late frosts, and its continuance to a late period in autumn prevents the annual wood from ripening, and subjects it to death from the cold of winter. In high and dry situations the danger is less, as the growth is commenced later and ceases sooner, so as to allow the wood to ripen.

To garden varieties and hybrids no place has been assigned in this work, which treats only of species botanically distinct. How, indeed, would it be possible to analyse the merits, decide on the peculiar claims to preference, describe the distinctive beauties, or even undertake the mere nomenclature of the hundreds of new roses, rhododendrons, or azaleas, that each succeeding season swell the accumulations of previous years. How fortunate it is that, by a process analogous to Darwin's natural selection, the weaker and poorer of these ephemeral novelties (an immense majority of the whole) become speedily extinct and forgotten ! Even those that survive the test of comparison and attain some few years of popularity, are found in course of time, in spite of the most careful budding and grafting, to deteriorate, and they are deposed by newer favourites. It is not intended to depreciate the ingenious labours of those who by their horticultural skill incite nature to produce these new and ever-varying forms of beauty, but it is not within the scope of

this work to chronicle these fleeting existences, these "Cynthias of the hour." The mysterious and still undefined laws and limits of hybridisation are well worthy of serious study and research; but the investigation involves the necessity for experiments not only numerous and accurate, but also extending over a long series of years.

There are, as we have before said, honourable exceptions to the routine mode of plantation generally adopted. Several owners of estates have appreciated the advantages of enriching their plantations with new and beautiful exotic trees and shrubs as they have been introduced, and have thus been instrumental in making this country the receptacle of every ornamental plant to which our climate may prove somewhat congenial. As far as their individual efforts have gone, they have forestalled the object for which this work was written. Still, they are but exceptions to the general rule, and but a small minority as compared with the great inert mass, who continue wedded to ancient practices and restricted within the old groove. All honour to those who, breaking through the trammels of mere traditionary culture, have looked upon beauty, variety, and utility as the guides to selection! Most of those who have pursued this plan, and possess fine plantations of new and choice trees, exhibit every willingness to allow others of sympathetic tastes to share their enjoyment, and visit their collections. On the other hand, there are numbers who would derive great delight from the inspection of a good Arboretum or Pinetum, were they aware of such being accessible to them. To further the views of both the donors and the recipients of so agreeable a boon, a list is given in the second part of this work of the finest collections of trees and shrubs to be found in various parts of the United Kingdom. That such a list, attempted for the first time, should be but imperfect, is both probable and excusable; but it will doubtless elicit further information which may, later on, remedy its deficiencies.

It is only such trees and ligneous shrubs as are hardy in this country that are noticed in this work, and these are by no means numerically predominant in comparison with the other forms of vegetation that thrive or might be found to thrive under our climatic conditions. For instance, a vast number of herbaceous plants, some annual, some biennial, some perennial, and some bulbous, are either indigenous to or have been introduced into Great Britain, and there still remain numberless species belonging to these tribes which might be and will be introduced. Of these a certain proportion are entitled by their beauty or usefulness to receive special attention. It is to be hoped that the principle of selection adopted in this work in respect to trees and shrubs may before long be adopted by some fellow-labourer in a similar work on herbaceous plants. A wide field is open in that direction. The unscientific amateur now enlivens his garden with such flowers, or utilises it with such vegetables, as he is familiar with; and if he rushes into the unknown, and orders from professional catalogues plants with names new to him, the chances are that he is disappointed;—not that such novelties are devoid of merit (for there is no plant which has not some merit), but that they are not what he wanted or expected. And yet what a number of beautiful herbaceous plants there are which the amateur would be delighted to procure, if acquainted with their peculiar merits! To take, for instance, two or three herbaceous plants nearly at random—*Astilbe rivularis*, *Tiarella cordifolia*, *Camassia esculenta*—is there any garden to which they would not prove ornaments? And yet in how many gardens are they to be found? Examples could be multiplied indefinitely, but these suffice to illustrate the wish expressed above, that herbaceous plants should engage the attention and become the theme of some writer competent to do them justice.*

* Since writing what precedes, we learn with pleasure that Mr. W.

In the remarks appended to each species in the following list, a reference is made to the different parts of our islands in which the less hardy ones may or may not be expected to thrive without protection. But these suggestions must be taken under reserve, as liable to many exceptions; for latitude governs acclimatisation only within certain limits. A variety of local circumstances bring so many counter-influences to bear on the growth of vegetation as to render geographical lines of demarcation by no means faultless guides for determining the hardiness of plants.

Robinson, the author of a very interesting work called *The Parks, Promenades, and Gardens of Paris*, is engaged on a task which will in great measure fill the void complained of. He has in preparation a work on alpine plants, which will comprise a selected list of the most beautiful amongst the smaller bulbous and herbaceous plants. But how as to those of larger growth? We hope that Mr. Robinson may determine on so expanding the meaning generally assigned to the word "Alpine," as to make it include all herbaceous plants whatever, irrespectively of size or locality.



YEW—*TAXUS BACCATA*.—Beaconsfield Churchyard.

PART I.
ALPHABETICAL LIST OF TREES & SHRUBS
SELECTED AS DESIRABLE FOR PLANTING IN
THE OPEN AIR IN THIS COUNTRY.

—◆—
1. ABIES—(*Spruce Fir*).

CONIFERÆ—MONÆCIA MONADELPHIA.

1. *Abies* ALBA (White Spruce).—N. America, 1700. Tree 40-50 feet. Leaves scattered round the branches, $\frac{3}{4}$ -inch long, of a pale green. Somewhat glaucous cones, 2-2 $\frac{1}{2}$ inches long. Bark very light-coloured, and the tree generally has a silvery appearance, which gives it great distinction and elegance. It grows very slowly when young, and is very impatient of transplantation, for which reason fine specimens are not often met with.

2. *Abies* ALBERTIANA (A. MERTENSIANA).—Oregon, 1858. Tree 120-140 feet. Leaves solitary, linear, flat, mostly placed in two rows, of various lengths, from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, slightly glaucous beneath. Cones solitary, oval, about 1 inch long, terminal, pendulous. A most elegant and graceful, as well as imposing and majestic tree. It is somewhat similar in habit and appearance to the Hemlock Spruce (*A. Canadensis*), but it is of more rapid growth, more gracefully pendulous, and attains a far greater size.

3. *Abies* CANADENSIS (Hemlock Spruce).—N. America, 1736. Tree 40-70 feet. Leaves solitary, flat, irregularly two-rowed, $\frac{1}{2}$ - $\frac{3}{4}$ inch long, light green above, with two silvery stripes

underneath. Cones small. Branches numerous and slender, drooping gracefully, but when the tree has grown to 30 feet and upwards, the large limbs are liable to be broken off, and its symmetry spoiled. Till of that size, it presents a most ornamental and elegant appearance. The growth is slow, and for a number of years its aspect is that of a compact pendulous shrub.

4. *Abies* CEPHALONICA (or PICEA C.)—Cephalonia, 1824. Tree 50-60 feet. Leaves flat, terminating in a sharp spine, standing at right angles on every side of the branches, glossy-green above, with two thin silvery lines beneath. Branches very numerous in regular tiers, very close to each other when the tree is young, from the short growth of the leading shoot for the first few years, whence the young tree has then the appearance of being as broad as it is tall; but after some years it grows more rapidly in height, and assumes a pyramidal form. This beautiful and remarkable tree is well worthy of cultivation. Two singular circumstances mark its history—First, it has never been found beyond the limits of one or two small localities, chiefly a confined mountain-range in the island of Cephalonia, and therefore shares with the *Wellingtonia*, and very few other plants, the distinction of being indigenous to a very diminutive spot on the wide earth; and, secondly, although Cephalonia is one of the most ancient *foci* of civilisation, and its soil has been trodden by man for more than twenty centuries, so distinct and beautiful a tree as the *A. Cephalonica* was never noticed till 1824 (when it was first sent to England by General Napier, Governor of the Ionian Islands), whilst, long before that, the New World and the most inaccessible parts of the Old, had been ransacked by botanists in search of new trees and plants.

5. *Abies* DOUGLASII.—N.-W. America, 1826. Tree 140-180 feet. Leaves flat, solitary, narrow, 1-1½ inch long, bright

green above, pale and glaucous beneath, imperfectly two-rowed. Cones solitary, pendulous, 2-3 inches long. Leading shoot frequently curved or zig-zag from rapidity of growth; straightening the second year. A noble, vigorous, and perfectly hardy tree, which is becoming a general favourite. The contrast between the tender light-green hue of the spring shoots and the dark dense foliage of the rest of the tree is quite charming. The young stems bear numerous small protuberances in the bark, which are filled with a resinous gum of agreeable odour. The cones (which have been abundantly produced in England) are very ornamental from the large sharp-pointed bracts with which they are clothed. There is a variety called *D. taxifolia*, with longer and darker leaves, but it is of slower growth and not nearly so lofty as the normal *A. Douglasii*.

6. *Abies EXCELSA* (or COMMUNIS) (Norway Spruce).—N. Europe, 1548. Tree, 120-150 feet. Leaves solitary, scattered, less than 1 inch long, dark-green, straight, and stiff. Cones terminal, pendent, 5-7 inches long. In young trees the branches are nearly horizontal, but in old trees they droop gracefully at their extremities. The growth is rapid and the timber excellent. It bears the shears well when young, and quickly forms a dense hedge. The variety *E. Clansbrasiliana* is a low compact bush, 3-4 feet in height, curious from its dwarfish habit.

7. *Abies GRANDIS* (or PICEA G.)—California, 1831. Tree 160-180 feet. Leaves two-rowed, green above, silvery beneath, linear, 1-1½ inch long, obtuse at apex. Cones solitary, cylindrical, 4-5 inches long. In moist valleys and on the banks of rivers it has been found to attain the height of 280 feet, and it is therefore one of the tallest trees known, excepting the *Wellingtonia gigantea*. It is very variable, and from the same seed-bed, are produced individuals differ-

ing greatly in length of pin, rate of growth, and general habit. As a rule, it is found that the longer the pin, the more vigorous and rapid is the development of the tree.

8. *Abies* LOWII (or P. LOWII or LASIOCARPA).—California, 1860. Tree 200-230 feet. Leaves about 2 inches long, linear, flat, in two rows, pale green, curling upwards. Branches in whorls. Cones 4-5 inches long. One of the most beautiful of this elegant tribe. As the leaves are developed late, they escape injury from spring frosts, and preserve their beauty unimpaired. By some the *Abies lasiocarpa* is considered distinct from the *A. Lowii*, but the differences appear to be rather individual than specific. Nothing can be more beautiful than the pale tender green leaves newly developed in spring. They are $1\frac{1}{2}$ to 2 inches long, with a graceful curl upwards, forming a striking contrast to the stiff, short, bristly pins of most of the other *Abies*.

9. *Abies* MENZIESII.—California, 1831. Tree 60-70 feet. Leaves solitary, thickly studded round the branches, $\frac{3}{4}$ -inch long, sharp-pointed, silvery beneath, falling off soon after the first season, and leaving scars on the branches. Cones 3 inches long, cylindrical, pendulous. In general appearance, it somewhat resembles the *A. Douglasii*, but it is hardly so fine a tree; nor is it either so rapid in its growth, or quite so hardy; still, it is a noble fir, well worthy of cultivation. Its leaves sometimes drop before the new ones expand, and this semi-deciduous habit detracts from its beauty for a short time in spring by leaving the branches almost naked.

10. *Abies* NIGRA (Black Spruce).—N. America, 1700. Tree 70-80 feet. Leaves spreading all round the branches, $\frac{1}{2}$ -inch long, dark bluish-green, thickly set, very stiff. Cones pendulous, egg-shaped, $1\frac{1}{2}$ -2 inches long; deep purple when young, dusky-brown when matured. It is the tree from which the Canadians make spruce-beer, but it is not applied to that use

so extensively as in former times. The cones are very ornamental in their early stage.



ABIES NOBILIS.—Wimbledon.

11. *Abies NOBILIS* (or *PICEA N.*)—California, 1837. Tree 150-200 feet. Leaves irregularly two-rowed, dull green above, silvery below, $1\frac{1}{2}$ inch long, flat, and turned upwards. Cones solitary, 6-7 inches long, with long bracts, adpressed backwards. A majestic tree, thickly clothed with branches and leaves, and being quite hardy it will at some future time form an elegant feature in our landscapes. When tall the silvery hue of the under side of the leaf comes prominently before the eye, and

the tree assumes the strikingly distinctive appearance of a tall pyramid of glaucous foliage.

12. *Abies* NORDMANNIANA (or *PICEA* N.)—South Russia, 1845. Tree 80-100 feet. Leaves broad, linear, long, shining, densely clothing the branches, which grow horizontally, and are rather pendulous. Cones large, erect, ovate, scales with reflect bracts, numerous produced. A noble species, worthy of general cultivation. Like many other members of this family, the lateral branches grow more rapidly than the leading shoot when the tree is young, and in that stage it is broader than it is tall. As it gets older, the proportions are reversed, and although it then loses (as children do their infantine graces) some of the beauty peculiar to the early stage, it is more than made up by the majesty of its mature growth. It appears to be quite hardy, and the spring shoots do not suffer from late frosts, as they are tardy in their development.

13. *Abies* ORIENTALIS.—Asia Minor, 1825. Tree 60-80 feet. Leaves solitary, very dense, $\frac{1}{2}$ -inch long, deep green, and in the young branches closely adpressed. Cones cylindrical, $2\frac{1}{2}$ -3 inches long. Branches stiff, densely clothed with foliage, and the younger ones resembling green ropes from their round form and closely pressed foliage. Altogether a curious and elegant tree, and well deserving of admittance in ornamental plantations, as, besides its elegant aspect, it is of rapid growth after being once fairly started, and appears to be quite hardy.

14. *Abies* *PICEA* (or *PICEA* PECTINATA).—Alps, 1600. Tree 80-150 feet. Leaves two-rowed, dark green above, with two silvery lines below, flat, $\frac{3}{4}$ -1 inch long. Cones cylindrical, erect, 6-7 inches long. When young, not only is the rate of growth very slow, but the leading shoot is very liable to be injured by spring frosts, and the form of the tree is thereby rendered stunted, and the head forky. But after a few years

the rate of growth becomes much accelerated and its shoots less easily affected by the temperature, so that patience in bearing with its early infirmities is rewarded, and it becomes a lofty and majestic tree. It prefers a deep soil and a low sheltered situation.

15. *Abies* PINDROW (or *PICEA* P.)—Bhotan, 1837. Tree 80-100 feet. Leaves flat, two-rowed, $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, ending in two sharp teeth, deep green. Cones solitary, erect, cylindrical, $4\frac{1}{2}$ inches long, of an intense purple colour. A distinct tree, to which the nearest approach is the *A. Webbiana*, but having longer leaves and differing from it in other minor respects. The *A. Webbiana* itself is a beautiful tree, but too tender (the more the pity) to be successfully planted, and it is therefore omitted in this work.

16. *Abies* PINSAPO (or *PICEA* P.)—Spain, 1838. Tree 60-70 feet. Leaves $\frac{1}{2}$ -inch long, stiff, placed at right angles thickly round the branches. Branches in whorls, very dense, spreading horizontally. Cones oval, 4-5 inches long, numerous produced. For some years, in its young state, the leading shoot grows slowly, whilst the lateral branches grow vigorously, giving the tree a rather squat appearance, from which it subsequently emerges into a tall tree of somewhat cylindrical shape. It is deservedly a great favourite, and is one of the finest ornaments of our shrubberies. It should be planted by itself, otherwise the lower branches will be killed by contact with other trees.

17. *Abies* SMITHIANA (or KHUTROW, or MORINDA).—Himalayas, 1818. Tree 100-140 feet. Leaves solitary, mostly scattered, but somewhat two-rowed, 1 inch long, awl-shaped, very sharp-pointed, stiff. The main branches spread horizontally, but the branchlets and twigs droop gracefully, and give the tree an elegant pendulous appearance. Cones pendulous,

solitary, 5-6 inches long. It grows pretty rapidly after it has attained the height of a few feet, but it appears somewhat impatient of transplantation.



ABIES PINSARO.

BIOTA PENDULA.

2. ACACIA.

LEGUMINOSÆ—POLYGAMIA MONŒCIA.

1. *Acacia* DEALBATA.—New Holland, 1823. Tree 40-50 feet. Perhaps the most elegant of all the acacias. Its bipinnate foliage is large and most delicately subdivided, of a pale glaucous green, and the large racemes of yellow globular flowers are of exquisite fragrance.

2. *Acacia* JULIBRISSIN.—Persia, 1745. Tree 30-40 feet. Leaves bipinnate, of a beautiful shape. Flowers white, very fragrant, in large globose heads, from which are exerted numerous purple stamens having the appearance of silken threads.

3. *Acacia* LOPHANTHA.—New Holland, 1803.—Tree 40-50 feet. Leaves elegantly bipinnate, drooping. Flowers yellow, in spikes.

N.B.—The foregoing three species of *Acacia* are not perfectly hardy, but they are so beautiful that they amply repay the trouble required for their protection. Placed against a wall, a matting during the severity of winter will secure them from injury in most cases; but even if killed nearly down to the ground, they are of such rapid growth that they will the next season push out shoots several feet in length, provided the frost has not reached the roots.

3. ACER—(*The Maple*).

ACERACEÆ—POLYGAMIA MONŒCIA.

1. *Acer* CAMPESTRE.—Britain. Tree 20-30 feet. In hedges, where it is frequently met with, it has a dwarf habit, but when

planted out by itself it grows more freely and attains the height of 30-40 feet. Leaves obtusely 5-lobed, and the bark of the main stem corky. Its stunted appearance when trimmed for hedges affords no criterion of its aspect when cultivated as an isolated tree under favourable conditions.

2. *Acer* CIRCINATUM.—N.W. America, 1827. Tree 30 feet. Leaves 7-lobed, nearly orbicular, and downy beneath. This is an elegant tree, distinguishable by its many-lobed leaves, and pale reddish-green colour. It is of slow growth, and long retains its shrub-like appearance.

3. *Acer* CRETICUM.—Candia, 1752. Shrub 10-15 feet, except in favoured situations, where it sometimes acquires exceptional size; nearly evergreen. Leaves small, acutely 3-lobed. It is of very slow growth, and is interesting as a nearly dwarf type of the Aceraceæ, independently of the beauty of its glossy leaves and dense tufted habit.

4. *Acer* ERIOCARPUM.—N. America, 1725. Tree 25-50 feet, according to the temperature in which it is grown. Leaves 5-lobed with blunt recesses, glaucous, and when young nearly white beneath, whence it is called the white maple. The flowers are small, sessile, with a downy ovary, and hence its specific name. It is of very rapid growth, especially in humid situations. The foliage when stirred by the wind offers a pretty contrast between the green of the upper and the white of the under surface. Some fine large specimens are occasionally to be found (one, for instance, in Kew Gardens), but from the liability of the tips of the annual shoots to be killed by frost, it is questionable if this species would thrive in a climate much north of London.

5. *Acer* LOBELII.—Naples, 1790. Tree 40-50 feet. Leaves somewhat similar to, but smaller than, those of the *A. platanoides*, from which it is further distinguished by longitudinal

stripes on the young wood, which give it some resemblance to the *A. striatum*, but it possesses over the latter the advantages of larger size and more elegant foliage. Its habit of growth is somewhat fastigate, which gives it a character distinct from every other species.

6. *Acer* MACROPHYLLUM.—N.W. America, 1812. Tree 50-70 feet. Leaves very large, deeply 5-lobed; the flowers yellow and very fragrant. This tree is of very rapid growth and quite hardy, and from its elegant aspect is well deserving of cultivation. It is the common sycamore on a larger scale.

7. *Acer* MONSPESSULANUM (MONTPELLIER MAPLE).—S. Europe, 1739. Tree 30-40 feet. Leaves rather small, cordate, 3-lobed. In many soils and situations it does not grow beyond the size of a large bush. With its peculiarly-shaped leaves and close habit it forms an elegant object. In our climate it rarely emerges from the shrubby stage, and would probably become still more stunted in regions north of the Trent, although it might survive the severity of winter.

Acer NEGUNDO. (See Genus NEGUNDO.)

8. *Acer* OBLONGUM.—Nepal, 1824. Tree 20 feet. Leaves oblong and coriaceous, which give the tree some resemblance to an Eucalyptus, for which reason, and for its great distinctness from all other maples, it is deserving of attention; but it is rather tender, and requires a sheltered situation.

9. *Acer* OBTUSATUM.—Hungary, 1825. Tree 40 feet. Leaves large, nearly round, as the 5 lobes are by no means deeply cut; soft and rather velvety beneath. This is a fine quick-growing tree, not sufficiently known or appreciated. When once settled into vigorous growth, its large drooping leaves lap over each other closely, forming a dense mass of foliage.

10. *Acer* PALMATUM.—Japan, 1832. Tree 20-25 feet. Leaves

deeply cut into 5 acuminate lobes. Branches and corolla purple. Very distinct from other species, and not yet sufficiently known in all its stages of growth. Its leaves are elegantly cut into a palmate shape, and are similar in form to those of the *A. polymorphum*. So far it seems to resist our winters very well.

11. *Acer PLATANOIDES* (NORWAY MAPLE).—Europe, 1683. Tree 50-60 feet. Leaves 5-lobed, about 5 inches in diameter, thin, green on both sides, and shining. A rapid grower and a very handsome tree. From the sap, sugar has been sometimes made in Sweden and Norway. It is one of the most valuable of the Maples, from the great rapidity of its growth and the beauty and endurance of its leaves. A milky fluid issues from the petioles when broken. The variety *P. laciniatum* has its leaves deeply and curiously cut, and one form of it is called the "eagle's claw" maple, from the peculiar shape of the curly leaves. Another variety, *P. colchicum rubrum*, is remarkable for the dark-red colour of its leaves, when first evolved and when fully matured. If better known it would doubtless become a great favourite, and no collection ought to be without it.

12. *Acer POLYMORPHUM* (var. *ATROPURPUREUM*).—Japan, 1855. Shrub 12-15 feet. Leaves digitate, lobes ovate-acuminate, serrated, of a fine dark purple tint. A very remarkable shrub both from the colour and the form of its leaves, which in shape resemble those of the *A. palmatum*. There are two other varieties from the same country with variegated leaves, which are very handsome. But it still remains to be ascertained how far these natives of Japan will stand the wear and tear of our variable climate. At all events, it will hardly be safe to trust them to the severer winters of North Britain, unless it be against a south wall, with additional protection from mats, etc., when the frost is intense.

13. *Acer PSEUDO-PLATANUS* (SYCAMORE).—Europe, and by some supposed to be a native of Britain ; at all events, the date of its introduction is unknown. Tree 40-60 feet. Leaves on long footstalks, 5-lobed, rather glaucous beneath. It grows rapidly, and, under favourable circumstances, is a long-lived tree. It yields, like the *A. saccharinum*, a certain quantity of sugar, but in no great abundance. It withstands the wind well, and does not easily become warped or unsymmetrical. Its foliage affords a dense shade, but unfortunately drops off early. The wood is in great demand for a number of useful purposes. The following is the most remarkable of its varieties :—

Pseudo-Platanus albo-variegatum.—This curious form of the tree bears leaves blotched with white. It is very ornamental, and does not give the idea of disease, as is frequently the case with plants bearing variegated leaves.

14. *Acer RUBRUM*.—N. America, 1656. Tree 40-50 feet. Leaves 5-lobed, of a silvery white beneath, acquiring in autumn a bright red tint. The blossoms, which are of a deep red, unfold a fortnight before the leaves, and the extremities of the branches, deeply tinged with red in early spring, are very noticeable. The bark, before the tree has attained its full growth, presents a smooth surface marked with white blotches ; and in autumn the leaves and petioles are of a red hue ; which peculiarities render it a very interesting tree. It thrives best in swampy sheltered places. Michaux says, "Before mahogany became generally fashionable in the United States, the most beautiful furniture was of red flowering Maple (*A. rubrum*), and bedsteads are still made of it, which, in richness and lustre, exceed the finest mahogany." The *A. rubrum* grows freely, but the extremities of the shoots are liable to injury from frost, which checks any rapid increase in size, and hence it is doubtful whether the tree would prove hardy in North Britain.

15. *Acer SACCHARINUM*.—N. America, 1735. Tree 40-50 feet. Leaves 5-lobed (lobes acute), smooth, glaucous beneath, resembling in shape those of the *A. platanoides*. This is the Sugar Maple, which for a time supplied in many parts of America the produce of the sugar-cane. The tree is perforated to about $\frac{1}{2}$ an inch within the wood, with two holes 5 inches apart, made $1\frac{1}{2}$ foot from the ground. At the foot of the tree is placed a trough capable of containing 3 gallons, into which the sap flows, and sometimes the trough is quite filled in 24 hours. The trough, when filled, is emptied into a receptacle, and the liquid (chiefly through evaporation by heat) crystallises into sugar. The quantity produced by each tree varies according to the dryness of the season and other causes, but is estimated to range from 2 to 4 lbs. of sugar annually from a full-grown tree. The sugar of commerce, through its comparative cheapness, is rapidly superseding maple-made sugar, even in the remotest districts of America. It is from the *Acer saccharinum* that the beautiful wood called the bird's-eye maple is obtained, so that it is, in several respects, a most useful and interesting tree. It is abundantly distributed over immense tracts in North America. It was calculated about a century ago that in the northern parts of New York State and of Pennsylvania alone, 300,000,000 trees of *Acer saccharinum* were to be found of indigenous growth.

16. *Acer SPICATUM*.—Canada, 1750. Tree 20 feet. Flowers in erect racemes or spikes. Fruit ornamental from its small keys (with their wings tinged with red) hanging in spikes from slender stalks. Leaves large, 3-lobed (lobes acuminate), of a dark green. It grows abundantly on mountain-sides, whence it is called the Mountain Maple, but in such situations its height rarely exceeds 8-10 feet.

17. *Acer STRIATUM*.—N. America, 1755. Tree 20 feet.

Remarkable for its smooth green bark, which is marked with black and white stripes. The leaves are large, 3-lobed, acuminate, and serrated. The effect of the white veins which variegates the stem is very pleasing, especially during winter, when this feature renders it conspicuous amongst other shrubs.

18. *Acer TATARICUM*.—South Russia, 1759. Tree 20-30 feet. Leaves cordate, undivided. Remarkable for the early expansion of its leaves and abundance of its flowers. Its appearance is very distinct, but its growth is slow, and it almost always preserves a shrub-like habit.

19. *Acer VILLOSUM*.—Himalayas, 1850. Tree 50 feet. Leaves large, 5-lobed, villous, and velvety, deeply tinged with brown when young, very elegant, and quite worthy of a sheltered situation, which it requires. The leaves are so beautifully soft and tender, especially when young, that the wind tears and rumples them. If this charming tree should thrive in England, it will prove a valuable acquisition. It probably suffers more from strong winds, which lacerate the delicate leaves, than from mere lowness of temperature.

4. ADENOCARPUS.

LEGUMINOSÆ—MONADELPHIA DECANDRIA.

1. *Adenocarpus INTERMEDIUS*.—Portugal and Sicily; date of introduction unknown. Shrub 4-5 feet. Leaves trifoliate, leaflets lanceolate, rather recurved. Flowers yellow, streaked outside with brown, in terminal spikes, numerous. A pretty shrub, requiring a dry, sheltered situation, and even with that precaution it is doubtful how far it would prove hardy in the north of England.

5. ÆSCULUS—(*Horse-Chestnut*).

SAPINDACEÆ—HEPTANDRIA MONOGYNIA.

1. *Æsculus* GLABRA.—N. America, 1822. Tree 20 feet. Leaves of a pale green, very smooth, rather smaller than, but of the same shape as, those of *Æ. hippocastanum*. Its claims to notice rest on the delicate colour, elegant form, and peculiar smoothness of the foliage, which has, however, the disadvantage of falling early in autumn.

2. *Æsculus* HIPPOCASTANUM.—Asia Minor, about 1629. Tree 60-70 feet. Leaves large, digitate, leaflets usually seven, the two lower ones smaller. Flowers in large erect racemes, white, with pink and yellow dots, very abundant and ornamental. Fruit echinated (prickly). An old favourite, prized as much for its noble appearance when full grown, and for the deep shade imparted by its large leaves, as for the elegance of its flowers. In favoured spots it is known to have attained the height of 100 feet.

3. *Æsculus* RUBICUNDA.—N. America, 1820. Tree 40 feet. Leaves similar to those of the preceding species, and distinguished from it chiefly by its flowers being of a light red colour, and by its less vigorous growth. It is not so massive or imposing in aspect, but its flowers of roseate tint render it one of the finest of our flowering trees.

6. AILANTUS.

XANTHOXYLACEÆ—POLYGAMIA MONŒCIA.

1. *Ailantus* GLANDULOSA.—China, 1751. Tree 60-70 feet. Leaves large, pinnate, with 9-11 leaflets. Flowers small, greenish, in upright panicles. The *Bombyx Cynthia*, a species of silk-worm, feeds on its leaves; and, as it lives and forms its cocoons

in the open air in our climate, attempts have been made to rear it in England on a large scale. Hitherto, however, the experiment has proved unsuccessful. In other respects the tree is well worth cultivation, as the beauty of its leaves and generally elegant appearance make it an ornament to any plantation.

The *Bombyx Cynthia* thrives well in the open air in ordinary seasons, and requires no care after being once placed on the tree. About August (sooner or later according to the season) it spins its cocoon on one of the leaflets, bending its edges inwards so as to form a partial envelope. As the tree is deciduous, the leaf would drop, and the cocoon with it, were it not that by an instinct, as admirable as it is incomprehensible to us, the insect, before forming its cocoon, attaches by its strongly adhesive threads the stalk of the leaf to the woody twig that sustains it. Hence the leaves that bear the cocoons are the only ones that do not drop, and these remain persistent throughout the whole of winter. The moth of the *Bombyx*, which emerges from the cocoon in May or June, is very large and beautiful, but very short-lived. In three or four days it has run its career. The males and females have paired, and the eggs have been laid within that short period. In ten to twelve days after being laid, the eggs are hatched, and the young worms at once begin to feed greedily on the *Ailantus* leaf in the open air. Each female produces an average of 200 eggs. The cocoons are composed of coarse but strong threads, which, however, are so glued together by a gummy substance, as to defy all efforts to unwind them. By carding the cocoons a species of waste silk is obtained, of small value as compared with that of the mulberry silkworm, but still worth twice or three times the price of raw cotton. Had the *Ailantus* done what was expected of it—viz. supplied abundance of leaves for food—it is possible that the cocoons of the *Bombyx*, low-priced as they were, might have yielded enough to pay a fair rent per acre on poor soils. But the

Ailantus was recalcitrant ; it refused to grow except on good land and under expensive culture ; it refused to produce abundant foliage except in warm seasons ; it refused to grow vigorously when pollarded (and to place and remove silkworms of small value on tall forest trees was out of the question). On the other hand, the *Bombyx Cynthia* refused to feed on any other leaf but that of the *Ailantus* ; and so, with all these refusals, *de part et d'autre*, the experiment was given up.

7. AKEBIA.

LARDIZABALACEÆ—MONŒCIA HEXANDRIA.

1. *Akebia* QUINATA.—Chusan, 1845. Climbing shrub. Leaves pinnate, leaflets 5, obovate, of a deep green colour. Flowers in pendulous racemes, dark pink, of an agreeable odour. An elegant twining plant, and tolerably hardy. Both the leaves and the flowers are pretty and quite distinct. Over trellis-work it forms beautiful festoons. Up to 1852, or even later, it was considered a greenhouse plant, but it is now fairly enrolled as a denizen of our gardens. How far north of London it may prove hardy is an unresolved question, but it is quite worth the trial.

8. ALNUS—(*Alder*).

BETULACEÆ—MONŒCIA TETRANDRIA.

1. *Alnus* CORDIFOLIA.—Naples, 1820. Tree, 50-60 feet. Leaves heart-shaped, acuminate, shining. Male catkins long and ornamental. This handsome tree, which is of pretty rapid growth, is quite hardy, and presents an appearance very distinct from that of all other species of alders ; indeed, at first glance, it would be taken for a poplar.

2. *Alnus* GLUTINOSA.—England. Tree 50-60 feet. Leaves

wedge-shaped, roundish, serrated, of a deep dark green. Male catkins cylindrical; female, conical, very short. In early spring the pendulous catkins have a very ornamental appearance. It is on the borders of streams and in marshy places that this tree thrives best, although even in dry soils it will not refuse to grow. The wood is fine-grained and compact, and much used by manufacturers of woodenware. In France, the "sabots" (or wooden shoes) are commonly made of it. It is also found to make the best charcoal for the use of gunpowder-manufacturers. There are several varieties, of which the best is the

A. g. imperialis. Its leaves are oblong, deeply cut into acuminate lobes, and, when first expanded, clothed with large stipules, which, however, soon fall. This is a seedling variety, raised in France in 1858, and is very ornamental.

3. *Alnus VIRIDIS.*—Hungary, 1820.—Shrub (or small tree) 8-10 feet. Leaves ovate, doubly serrated (that is, teeth alternately long and short), smooth. Remarkable for the abundance of its catkins, of which the female ones are elliptic, and the male $2\frac{1}{2}$ inches long, slender, cylindrical. In its fruit, and in parts of its inflorescence, it so nearly approaches the genus *Betula*, as to be, by some botanists, included in it. It produces its copious crops of male catkins at an early age, and at a period of the year (February, March) when any adornment to our shrubberies is peculiarly acceptable; the female catkins are developed somewhat later.

9. ALOYSIA—(*Scented Verbena*).

VERBENACEÆ—DIDYNAMIA ANGIOSPERMA.

1. *Aloysia CITRIODORA.*—Chili, 1784. A small tree 8-20 feet, according to soil and situation. The leaves are lanceolate, acuminate, and delightfully fragrant; the flowers small, whitish,

in terminal spikes. It is not quite hardy, and is frequently killed to the ground in our winters, but generally shoots up again luxuriantly. In Guernsey, however, it flourishes vigorously, and assumes the dimensions of a small tree; and near Cloyne in Ireland, and Reading in England, there were, a few years ago, some old and fair-sized specimens in the open air. It is quite worth some trouble to preserve through the winter, but it will be vain to try it much north of London.

10. AMELANCHIER.

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Amelanchier* BOTRYAPIUM (or MESPILUS CANADENSIS).—N. America, 1746. Tree 15-20 feet. Commonly known as the Snowy Mespilus. Leaves oblong-elliptical, downy when expanding, but afterwards smooth. Flowers white, so abundantly produced in numerous racemes, as to give the tree quite a snowy appearance. Fruit small, purplish. In autumn, the leaves assume a fine reddish-yellow tint. Its early and copious flowers have deservedly rendered it a general favourite, and it is quite hardy.

11. AMMYRSINE.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Ammyrsine* BUXIFOLIA (or LEIOPHYLLUM THYMIFOLIUM).—Carolina, 1736. Small evergreen shrub 1 foot. Leaves small, ovate, acute, of a shining green. Flowers in terminal corymbs, white, copiously produced. It will only thrive in peat-soil, and is a fit companion for the Heaths, Empetrum, and other denizens of a peat-bed. It appears to stand our winters very well.

12. AMORPHA—(*Bastard Indigo*).

LEGUMINOSÆ—MONODELPHIA DECANDRIA.

1. *Amorpha FRAGRANS*.—N. America, 1800. Shrub, 7-8 feet. Leaves pinnate, leaflets 6-8, oblong, mucronate. Flowers dark purple in erect spikes, freely produced. It forms a pretty shrub, with arched branches, from which the elegant pinnate leaves hang gracefully. The long annual shoots get naturally pruned by the winter frosts, but it would otherwise have to be done by the gardener's knife, as the growth is too luxuriant unless kept within bounds.

2. *Amorpha FRUTICOSA*.—Carolina, 1724. Shrub 10-15 feet. Leaves pinnate, leaflets numerous, elliptic. Flowers in long spikes of dark purple colour, small individually, but conspicuous from their number, dotted with yellow. Branches long, pendulous. From the luxuriance of their summer growth, the *Amorphas* seldom ripen the whole of the wood they make, so that the annual shoots are generally cut off to half their length by the winter frosts, but this is rather an advantage than otherwise, as it makes the bush more compact.

13. AMPELOPSIS.

VITACEÆ—PENTANDRIA MONOGYNIA.

1. *Ampelopsis HEDERACEA* (Virginian Creeper).—N. America, 1629. Climbing shrub of very rapid growth. Leaves digitate, leaflets 5, stalked, glossy green in summer, changing in autumn to a lovely deep red tint. This well-known favourite has covered more acres of brick-walls, and changed more ugliness into beauty, than any other plant. Not only in the pure air of the country, but amongst the tainted breezes of cities, it freely fulfils its kindly mission, and

rejoices the eye of the street-dweller with its pleasant verdure and fine autumnal tints.

2. *Ampelopsis* VEITCHII.—Japan, 1864. Climbing shrub. Leaves partly trifoliate and partly only three-lobed, acuminate and serrated, of a reddish colour during summer, and turning to a rich brown in autumn. To the great beauty of its leaves is added the very interesting manner in which it clings to walls. It sends out rootlets composed of 6 to 8 branches, each terminating in a circular disk. These disks attach themselves with hermetic tightness to the bricks, so that the air is excluded; and each disk adheres to the surface with such tenacity, that, when forced away, it brings with it particles of the brick itself. It hardly grows with the same rapidity as the preceding species, but is, if possible, more ornamental and interesting. It is synonymous with the *A. Roylii* of some of the foreign nurserymen, and is sometimes also called *A. tricuspidata*.

14. AMYGDALUS—(*Almond*).

ROSACEÆ—ICOSANDRIA MONOGYNIA.

1. *Amygdalus* COMMUNIS.—Asia, 1538. Tree 20-30 feet. Leaves oblong-lanceolate, serrated. Flowers of a pale rose colour, very numerous, and expanding early in March. These resist the spring frosts better than most flowers, and hence the tree (though not generally well shaped in the disposition of its branches) is a favourite one, especially the double-flowering variety.

2. *Amygdalus* NANA.—South Russia, 1683. Shrub 3 feet. The leaves, flowers; and fruit bear a dwarfish resemblance to those of the *A. communis*, in which circumstance the interest of the shrub chiefly resides, but it neither flowers so early nor so abundantly.

3. *Amygdalus* ORIENTALIS.—Levant, 1756. Small tree 10-15 feet. Leaves similar in shape to those of the *A. communis*, but so covered with a white down as to have quite a silvery appearance, and as they remain on the tree during a great part of winter, they give to the tree a very distinctive aspect. Flowers rose-coloured, but not so abundantly produced as on the other species. It is rather sensible to frost, and would hardly bear a climate more northerly than that of London.

4. *Amygdalus* PERSICA (var. VERSICOLOR, fl. pl.)—Persia, 1548. Shrub 10-12 feet. One of the most profusely-flowering species, covered in spring with myriads of its gay pinkish double blossoms, and so hardy as to bid defiance to our "Etesian easterly" winds. It is well known as the double-flowering peach, and it is by artificial culture that it has been brought to this state of copious double inflorescence. Other processes equally artificial, but directed to other ends, have resulted in a large variety of fruit-bearing plants, all of them true peaches, but each having its peculiar characteristics as to flavour, productiveness, etc.

15. ANDROMEDA.

ERICACEÆ—DECANDRIA MONOGYNIA.

Andromeda ARBOREA (Sorrel tree).—See *Lyonia arborea*.

1. *Andromeda* FLORIBUNDA.—Georgia, 1812. Evergreen shrub 4-5 feet. Leaves ovate, oblong, acute, serrulate, coriaceous. Flowers in racemose, unilateral panicles, white, very abundantly produced, sometimes twice in the year. It forms a dense leafy bush, spreading laterally more than upwards, and is beautiful at once in its flowers, in its foliage, and its habit of growth. It flourishes best in peat-soil, but is not so fastidious

in that respect as many of its congeners. It has proved quite hardy in spite of its southern origin, and is so desirable a plant in every point of view that no garden ought to be without it.

2. *Andromeda* POLIFOLIA.—England. Evergreen shrub 2-3 feet. Leaves oblong, glaucous beneath. Flowers in terminal unilateral bunches, ovate, of a pale red colour. This shrub will hardly thrive except in humid peat-soil.

16. ANDROCEMUM—(*Tutsan*).

HYPERICACEÆ—POLYADELPHIA POLYANDRIA.

1. *Androsæmum* OFFICINALE.—England. Evergreen shrub 3-4 feet. Leaves ovate, sessile, of a bright green, somewhat paler beneath. Flowers yellow, in panicles, showy. Fruit baccate, in which chiefly it differs from the Hypericums. It is useful from its endurance of the drip of trees, besides being ornamental from its numerous flowers and dark purple berries. It is quite hardy, and ought not to be so rare in our gardens as it is.

17. ANTHYLLIS—(*Kidney Vetch*).

LEGUMINOSÆ—MONADELPHIA DECANDRIA.

1. *Anthyllis* BARBA JOVIS.—S. Europe, 1640. Shrub 3 feet. Leaves pinnate, evergreen, hoary and silky beneath. Flowers pale yellow, abundant. A pretty silvery shrub, requiring a sheltered situation. The delicate yellow of the blossom is well in keeping with the grey silvery hue of the foliage. It delights in a sunny aspect, and will not bear severe frosts, so that it is only in the southern counties of England that it ought to be planted.

18. ARALIA.

ARALIACEÆ—PENTANDRIA PENTAGYNIA.

1. *Aralia* JAPONICA.—Japan, 1838. Tree 15-20 feet. Leaves very large, doubly and trebly pinnate, leaflets ovate-acuminate, nearly entire, somewhat wrinkled. Flowers in large panicles, white, somewhat resembling individually those of the Elder. This magnificent species has larger leaves, grows to a greater size, and is longer lived than the *A. spinosa*. The stem and shoots have a few spines on them, but are by no means so much beset with prickles as in the latter species.

2. *Aralia* SIEBOLDTII.—Japan, 1864. Evergreen shrub 6-8 feet. Leaves large, palmate, deeply cut into 6-9 ovate lobes, of a fine light green, downy when first evolved, afterwards nearly glabrous, on long footstalks, those of the lower leaves recurved. Flowers white, in large panicles. A splendid addition to our fine-foliaged plants, and, if it should prove hardy, no garden ought to be without it. We can, however, hardly indulge the hope that it will become acclimatised in the northern parts of our island, and must perhaps be content if it flourishes in Ireland and our south-western counties.

3. *Aralia* SPINOSA.—Virginia, 1688. Tree 12-18 feet. Leaves doubly pinnate, large, leaflets ovate, acuminate, serrated. Flowers in large, much-branched panicles, beset with soft down; petals white, reflexed. Stem and shoots very prickly. The stem sometimes dies down to the ground, and is replaced by numerous suckers. The large leaves and panicles of flowers give the tree a very distinct and noble appearance.



ARAUCARIA IMBRICATA.

19. ARAUCARIA.

CONIFERÆ.—DICECIA MONADELPHIA.

1. *Araucaria* IMBRICATA.—Chili, 1796. Tree 120-150 feet. Leaves in whorls, 6-8 in number, spirally placed, closely encircling the branches, very stiff and sharp-pointed, concave, wide at the base, of a deep green colour, and remaining attached to the tree for many years, 1-1½ inch long. Cones globular, solitary, terminal, about 7 inches in diameter, each containing

200-300 seeds, which are edible, and in Chili afford sustenance to numerous tribes of Indians. The staminiferous (or male) trees are said to attain a height much inferior to that of the cone-bearing (or female) plants. The branches, thickly closed with the stiff persistent leaves, droop and then again ascend. This remarkably distinct tree is too well known and appreciated to need any recommendation. It appears to be quite hardy, as it has seldom sustained any greater injury from our severest winters than the browning of the tips of some of the leaves. If, as is likely, it should attain in this country the height to which it grows on its native mountains, it will form a most striking and picturesque feature in our parks and plantations. But it requires admixture with other trees, by way of contrast with its formal shape and solemnity of aspect.

20. ARBUTUS—(*Strawberry Tree*).

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Arbutus* ANDRACHNE.—Greece, 1724. Evergreen tree, 15-20 feet. Leaves large, oblong, coriaceous, shining, entire or serrated. Flowers in terminal panicles, greenish white. Fruit like that of the common strawberry-tree. The outer bark cracks every year, and peels off in thin papery layers.

2. *Arbutus* PROCERA.—N.W. America, 1827. Evergreen tree, 20-30 feet. Very similar to the *A. andrachne*, but the bark peels off even more completely, and leaves a beautifully smooth, red surface, which is at once curious and ornamental. It is also of more rapid growth than the other species, and the leaves have a beautiful glaucous tinge, especially on the under side, where they are nearly white. It is quite as hardy as the *A. unedo*, and much more beautiful. All the species

38 ARCTOSTAPHYLOS (BEARBERRY)—ARISTOLOCHIA (BIRTHWORT).

thrive best in a mild, humid climate, such as that of Ireland or Devonshire.

3. *Arbutus* UNEDO.—Ireland. Evergreen tree, 20-30 feet. Leaves oblong-lanceolate, serrated, of a lively, glossy green. Flowers in pendulous racemes, bell-shaped, white, tinged with green or pink, succeeded by fruit resembling strawberries, which ripen slowly and remain long on the tree, which thus is simultaneously adorned with flowers and with green as well as ripe fruit. It partially suffers from severe frosts, but is hardly ever killed outright.

21. ARCTOSTAPHYLOS—(*Bearberry*).

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Arctostaphylos* UVA-URSI.—England. Evergreen trailing shrub. Leaves obovate, entire, coriaceous, glossy. Flowers in small terminal clusters, pale red. Berries red, not eatable. In its mode of growth it is curious, as it spreads close to the ground over a large space, and is well adapted to rock-work. It thrives best in peat, and its native habitat is in rocky places in the alpine districts of Scotland and Ireland.

22. ARISTOLOCHIA—(*Birthwort*).

ARISTOLOCHIACEÆ—GYNANDRIA HEXANDRIA.

1. *Aristolochia* SIPHO.—N. America, 1763. A tall twining plant of rapid growth, with large heart-shaped leaves. Flowers of curious form (bent like a siphon), of brownish-yellow colour, and scented. It is well adapted for a tree-climber, as it clothes the stem with its fine leaves, and ascends to the summit of tall trees. The stems and twigs have a strong scent as well as the flowers. Its enormous leaves and eccentric flowers give it a character quite distinct from any other plant.

23. ARISTOTELIA.

TILIACEÆ—POLYADELPHIA POLYANDRIA.

1. *Aristolelia* MACQUIL.—Chili, 1733. Evergreen shrub 15 feet. Leaves 2 inches long, dentate, smooth, and of a fine green colour. Flowers small, greenish, axillary. It is liable to injury from frost, but grows vigorously the ensuing season from the roots. It is not of easy cultivation, and is only adapted to sheltered spots, where it can put forth its fine foliage unharmed by severe or cold winds. The leaves frequently show traces of a yellow variegation. Its cultivation must be confined to our southern counties, it being too tender for any higher latitude than that of London.

24. ARMENTIACA—(*Apricot*).

ROSACEÆ—ICOSANDRIA MONOGYNIA.

1. *Armeniaca* VULGARIS.—Armenia, circa 1550. Tree 20-30 feet. Leaves cordate, of a light glossy green. Flowers white, numerous, and expanding in early spring. This is the parent of the many varieties of fruiting apricots, to which it bears the same relation as the crab does to our eating apples. As a flowering tree, adorning our shrubberies at about the same period and almost with the same profusion of blossom as the almond, it is very ornamental and desirable. Notwithstanding its southern origin, it appears to be tolerably hardy.

25. ARTEMISIA—(*Southernwood*).

COMPOSITÆ—SYNGENESIA SUPERFLUA.

1. *Artemisia* ABROTANUM.—Spain, 1596. Evergreen shrub 4-5 feet. Leaves pinnate or bipinnate, segments hair-like,

40 ASIMINA (PAPAW)—ASTRAGALUS (GOATS' THORN).

very odorous when bruised. Flowers small, yellowish. A favourite in cottage-gardens. It bears the smoke of cities well, and is very hardy.

26. ASIMINA—(*Papaw*).

ANONACEÆ—POLYANDRIA POLYGYNIA.

1. *Asimina* TRILOBA.—N. America, 1736. Shrub 10-15 feet. Leaves oblong, widening from the base to the summit, 4-5 inches long, acuminate, smooth. Flowers purple, large, solitary, pendulous. Fruit a large berry, 2-3 inches long, oval, yellowish, edible, but not very pleasant. It is a curious and elegant shrub, but of slow growth and difficult culture. It will only thrive in peat-soil, and is of doubtful hardiness in latitudes north of London.

27. ASTRAGALUS—(*Goats' Thorn*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Astragalus* TRAGACANTHA.—S. France, 1640. Low shrub rarely above 1 foot in height. Leaves pinnate, with numerous elliptic hoary leaflets. Flowers whitish purple, nearly sessile. The petioles, after the leaflets have dropped, are persistent, and, being very spiny and dense, give the plant a peculiar aspect. From this, or some very nearly-allied plant, gum-tragacanth is obtained. It is very well adapted for rock-work, and delights in a sunny exposure. The inflorescence is inconspicuous, and the chief merit of the shrub lies in its curious and somewhat grotesque appearance—a feature by no means devoid of interest when placed in contrast with more showy and symmetrical plants.

28. ATRAPHAXIS.

POLYGONACEÆ—HEXANDRIA TRIGYNIA.

1. *Atraphaxis* SPINOSA.—Shores of the Caspian Sea, 1732. Shrub 2-3 feet. Flowers white, tinged with pink, abundant. Leaves glaucous. The side shoots are spinous, and give the plant a remarkable appearance. It requires peat-soil to thrive well, and is peculiarly adapted for rock-work as a curious and interesting little plant.

29. ATRIPLEX—(*The Orache*).

CHENOPODIACEÆ—POLYGAMIA MONŒCIA.

1. *Atriplex* HALIMUS.—Spain, 1640. Evergreen shrub 6 feet. Leaves white, silvery, of deltoid shape. It seldom flowers in England; but, from the peculiar hue of its leaves, which appear as if covered with a mealy powder, it deserves a place in ornamental plantations, affording, as it does, a pleasant contrast to the brighter green of surrounding shrubs. Like many of the Chenopodiaceæ, it thrives in the proximity to sea-breezes.

30. AUCUBA.

LORANTHACEÆ—DIOECIA TETRANDRIA.

1. *Aucuba* JAPONICA.—Japan, 1783. Evergreen shrub 20-25 feet. Leaves large, ovate, acuminate, very similar to those of the common laurel. Flowers whitish-green in small bunches, and the female ones succeeded by an oblong red berry. Till a few years since only the blotched-leaf variety was known, and of that only the female plant. At first it was treated as a greenhouse shrub, but it was afterwards found

to be very hardy, and it will stand the shade and drip of trees better than any other evergreen. The male plant recently introduced, by the fecundating powers of which the old female species now produces its beautiful berries, is of itself an elegant and distinct plant ; in addition to which several blotch-leaved varieties have been introduced at the same time, which, combined, make the genus *Aucuba* more and more worthy of notice. But, after all, the type species, with its large glossy green leaves, is unsurpassed in beauty by all the numerous varieties which artificial culture, both in Japan and in England, has produced. As yet, it is rare ; but it will, no doubt, soon become as popular and as abundant as the old blotched-leaved variety which, hitherto, has alone been cultivated.

31. AZALEA.

ERICACEÆ—PENTANDRIA MONOGYNIA.

1. *Azalea* NUDIFLORA.—N. America, 1734. Shrub 4-5 feet. Leaves lanceolate-oblong, ciliated on the margin, midrib bristly beneath. Flowers in terminal clusters of various colours, generally variegated. The parent of numerous varieties.

2. *Azalea* PONTICA.—Levant, 1793. Shrub 5-6 feet. Leaves ovate-oblong, hairy, ciliated. Flowers bright yellow, funnel-shaped, stamens very long. Although, of all species, it is the most common and the most easily raised from seed, it is a most lovely ornament of our borders when covered with its brilliant golden blossoms.

3. *Azalea* PROCUMBENS.—England. Small procumbent shrub. Leaves small, elliptic-ovate, pointed. Flowers in terminal clusters, rose-coloured. Interesting as being the only British representative of the genus. It is (like many of our wild mountain plants) not easy of culture, and requires a peat-soil.

4. *Azalea VISCOSA*.—N. America, 1734. Shrub 3-4 feet. Leaves oblong, acute, ciliated on the margins. Flowers in terminal clusters, hairy and clammy, white, fragrant. From the hybridisation of this with several other natural species, an innumerable progeny of diversified beauty has sprung, some remarks on which will be found under the head of "Rhododendron."

32. BACCHARIS—(*Groundsel Tree*).

COMPOSITÆ—SYNGENÉSIA SUPERFLUA.

1. *Baccharis HALIMIFOLIA*.—N. America, 1683. Shrub 10-12 feet. Leaves obovate, irregularly crenated on the terminal portion. Flowers purplish-white, resembling in form those of the common groundsel. Both leaves and stem are sprinkled with a whitish powder, which gives it a peculiar glaucous appearance. It is one of the very few ligneous plants belonging to the order Compositæ (Daisy and Dandelion tribe), although of all the vegetable world this is one of the largest and most widely spread families.

33. BAMBUSA—(*Bamboo*).

GRAMINEÆ—HEXANDRIA MONOGYNIA.

1. *Bambusa METAKE*.—Japan, 1848. Shrub 8-10 feet. Leaves linear-lanceolate, about 12 inches long, evergreen, stiff, and siliceous, of a paler green beneath. Flowers in panicles similar to those of the larger grasses. Stems increasing in number and height each year, round, very strong, jointed, and of small diameter as compared with their height. A hardy, very curious, and desirable specimen of the Bamboo family, which forms so striking a feature in tropical scenery. How far north of London will it prove hardy? This is a question which experience alone can solve.

34. BENTHAMIA.

CORNACEÆ—TETRANDRIA MONOGYNIA.

1. *Benthamia FRAGIFERA*.—Nepal, 1825. Tree 20-30 feet. Leaves somewhat coriaceous, acuminate-ovate, lanceolate, pale beneath. Flowers in globular heads, surrounded by a large, petaloid, 4-parted yellowish involucre. Fruit reddish, similar in shape to, but larger than, that of the mulberry, edible, but not of very agreeable flavour. It stands our winters in Cornwall, and, if tried, might be found to be nearly hardy near London, but scarcely much north of it.

35. BERBERIDOPSIS.

BERBERIDACEÆ—ENNEANDRIA MONOGYNIA.

1. *Berberidopsis CORALLINA*.—Chili, 1864. Evergreen shrub 6-8 feet, of a rather scandent habit. Leaves cordate-ovate, coriaceous, ciliated with spiny teeth, deep green above, glaucous beneath. Flowers of a coral red, in terminal pendulous racemes, on long red peduncles, abundantly produced. This beautiful shrub has hitherto proved so nearly hardy, that in the southern counties we may hope to rear it in the open garden, with some slight protection during severe frosts. When in full blossom it displays a most gorgeous sight.

36. BERBERIS—(*Berberis*).

BERBERIDACEÆ—HEXANDRIA MONOGYNIA.

1. *Berberis CONCINNA*.—Himalayas, 1853. Shrub 3 feet. Leaves small, obovate, coriaceous, with spiny teeth, light green above, silvery white beneath. Flowers pale yellow, globose, solitary, axillary. Fruit bright red. The chief beauty of this species consists in the contrast presented by the upper and lower surfaces of the leaves, the latter appearing as if painted of a pure white.

2. *Berberis DARWINII*.—Patagonia, 1847. Evergreen shrub 6-7 feet. Leaves ovate, dentate, spinous, of a bright glossy green. Flowers in racemes, yellow tinged with red, abundant, and very ornamental. A beautiful shrub, well worthy of general cultivation. It may here be noticed that a large proportion of the known species of *Berberis* are natives of that barren and inhospitable land which, on either side, coasts the Straits of Magellan. In that region of cloud and wind the flora is very poor in number of species generally, but wealthy beyond all other localities in species of the *Berberis*. This singular fact cannot arise out of climatic influences alone, as the species of *Berberis* indigenous to that region thrive vigorously when transplanted into England; nor can it be owing to local hybridisation, as the species are all sufficiently distinct.

3. *Berberis DEALBATA*.—Mexico, 1830. Shrub 8-10 feet. Nearly evergreen. Leaves roundish or wedge-shaped, dentate, with spiny teeth, green above, white beneath. Flowers yellow, in small pendulous racemes, produced very late in autumn. It is pretty hardy, considering the latitude of its native country.

4. *Berberis DULCIS*.—Magellan, 1828. Shrub 6-8 feet, nearly evergreen. Leaves obovate, entire, somewhat glaucous on the under side. Stem spiny. Flowers solitary, of a deep yellow, pendulous. Berries globular, black, eatable. A very pretty early-flowering shrub, apparently quite hardy, and worthy of admittance in every garden.

5. *Berberis STENOPHYLLA*.—Hybrid. Evergreen shrub 6-8 feet. Leaves in tufts of 4-6, with a sharp spine at the base, of a dark green, linear-lanceolate, mucronate, with revolute margins. Flowers in small pendulous racemes springing from each of the leafy tufts, and hence exceedingly numerous, of a bright yellow. Annual shoots so long and so weighted with flowers and fruit as to become arched and pendulous. A most ornamental shrub, profusely laden in May with brilliant blossoms, and subsequently with berries.

37. BETULA—(*Birch*).

BETULACEÆ—MONŒCIA POLYANDRIA.

1. *Betula ALBA*.—England. Tree 50-70 feet. Leaves ovate, acute, serrated. Bark silvery. Spray dense yet light, occasionally subject to excrescences in the shape of twiggy tufts resembling birds' nests. It varies much from seed, whence the numerous varieties, of which, however, the most distinct and noteworthy are—

A. pendula—with long slender pendulous shoots, producing a most elegant weeping appearance.

A. urticifolia—with leaves hairy, serrated, and deeply cut or lacinated.

In chap. xviii. book i. of Evelyn's *Sylva* will be found a curious statement as to the abundance and the virtues of the sap which exudes from incisions made in this tree. He says, "Out of this aperture will extil a limpid and clear water, which (as I am credibly informed) will, in the space of twelve or fourteen days, preponderate and outweigh the whole tree itself, body and roots;" and he is exceedingly irate with a Dr. Stubb, whom he terms an "unhappy angry man," for expressing some doubts whether the quantity "extilled" could be so great as stated.

2. *Betula BHOJPUTRA*.—Kamaon (India), 1850. Tree 60-70 feet. Leaves oblong, acute, serrated, somewhat heart-shaped at the base. Bark bright silver, furnishing quantities of thin flexible laminæ, used by the natives both for paper and for lining the tubes of hookahs. No doubt it is the tree referred to in the following passage of Quintus Curtius, lib. viii.—"Libri arborum teneri, haud secus quam chartæ litterarum notas capiunt." How little have the natives changed the customs of their forefathers, the contemporaries of Alexander!

3. *Betula LENTA*.—N. America, 1759. Tree 60-70 feet. Leaves large, cordate-ovate, acuminate, serrated, expanding early, and at that period covered with a silvery down. The flowers and the leaves (when bruised) afford a pleasant fragrance. It is of rapid growth, and the wood is very valuable ; so that, for many reasons, this tree deserves far more attention than has been bestowed upon it.

4. *Betula NANA*.—Lapland, 1548. Shrub 3-6 feet. Leaves orbicular, crenate. Catkins erect, cylindrical. Interesting from its being one of the few shrubs that enliven the bleak wastes of Lapland and North Russia.

5. *Betula NIGRA*.—N. America, 1736. Tree 60-70 feet. Leaves large, ovate, pointed, dentated, forming at the base a very regular acute angle with the petiole. The bark (except in old trees) is reddish, and the epidermis separates and curls up for nearly the whole length of the trunk. Its habit of growth is very graceful.

6. *Betula PAPHYRACEA*.—N. America, 1750. Tree 60-70 feet. Leaves ovate, pointed, serrated. The bark (except on very old trees) is white and silvery, and when divided into sufficiently thin sheets is used as paper, whence its name "Paper Birch." In Canada the bark is used for making canoes.

Michaux notices that the bark of this tree is nearly indestructible. "Trees long since prostrated by time are often met with in the forests, whose trunk appears sound, while the bark contains only a friable substance, like vegetable mould."

38. BIGNONIA—(*the Trumpet Flower*).

BIGNONIACEÆ—DIDYNAMIA ANGIOSPERMIA.

1. *Bignonia CAPREOLATA*.—N. America, 1710. A climb-

ing shrub, almost evergreen. Corolla trumpet-shaped, reddish-yellow, succeeded by long follicles. Leaves of two leaflets, cordate, oblong, and of an elegant shape. It attaches itself to walls or the trunks of trees by small trifid tendrils, and both leaves and flowers are very ornamental. It bears a great resemblance to the Tecoma, from which genus the Bignonia only differs by a slight botanical distinction connected with the mode of fructification.

39. BIOTA—(*Arbor Vitæ*).

CONIFERÆ—MONOECIA MONADELPHIA.

1. *Biota* ORIENTALIS (THUJA ORIENTALIS).—China, 1752. Tree 20-30 feet. Leaves adpressed, imbricated in four rows, furrowed along the middle. Cones elliptic, $\frac{1}{2}$ -inch long. Branches at first horizontal, then turned upwards nearly parallel with the trunk, giving the tree a pyramidal or nearly columnar appearance. It is distinguished from the American *Arbor Vitæ* (*Thuja occidentalis*) by its denser habit of growth, smaller leaves of lighter green, and the more fastigate direction of its branches. The variety *O. aurea* has beautiful gold-tipped branchlets, is more compact, and keeps to an almost globular shape. In spring especially, the colour of the newly-evolved leaves is most brilliant, and produces a fine effect. The Biotas were formerly included in the genus *Thuja*, from which some differences in the fruit and seed properly separate them.

2. *Biota* PENDULA (THUJA FILIFORMIS).—Japan, 1828. Tree 15-20 feet. Leaves scale-like, imbricated, adpressed, pointed. Branches slender, long, drooping. Cones roundish, erect, clustered. A curious and very distinct species, of slow growth, the pendulous branchlets of which present the appearance of green twisted twine.

40. BORYA.

URTICACEÆ—DICECIA DI-TRIANDRIA.

1. *Borya* LIGUSTRINA.—N. America, 1812. Shrub 12 feet. Leaves lanceolate, small, of a deep green. Flowers inconspicuous. Bark dark brown or purple. This plant somewhat resembles the privet in appearance and habit, but its branches are fewer, and it forms a lighter and more elegant bush.

41. BROUSSONETIA—(*Paper Mulberry*).

URTICACEÆ—DICECIA TETRANDRIA.

1. *Broussonetia* PAPYRIFERA.—China, 1751. Tree 20-25 feet. Leaves heart-shaped, either entire or cut into lobes of irregular patterns. Fruit oblong or club-shaped, deep scarlet when ripe, and of a rather insipid taste. The male and female flowers are on different trees. In China and Japan the bark is extensively used in the manufacture of paper, and the paper itself is used for multitudinous purposes besides those for which paper serves with us, such as purses, boxes, cigar-cases, umbrellas, fans, twine, etc., and, when oiled, for water-proof coats and trousers. The leaves are curious on account of their great variety of shapes, some being entire, and others cut and lobed in different ways.

42. BUDDLEA.

SCROPHULARIACEÆ—TETRANDRIA MONOGYNIA.

1. *Buddlea* GLOBOSA.—Chili, 1774. Shrub 12 feet. Leaves lanceolate, crenated, under sides hoary. Flowers in globular heads, bright yellow, fragrant. It is sometimes killed down to

the crown of the stem by hard frosts, but springs up again luxuriantly. It has rather a straggling habit of growth, but its flowers, at once curious and pretty, entitle it to attention. It will hardly stand our winters north of the Trent.

43. BUMELIA.

SAPOTACEÆ—PENTANDRIA MONOGYNIA.

1. *Bumelia* TENAX.—Carolina, 1765. Tree (nearly evergreen) 20 feet. Leaves obovate-lanceolate, silky beneath. Flowers in axillary fascicles, small, white. Interesting as a type of the order Sapotaceæ, of which the genera are mostly tropical. It is otherwise devoid of any very attractive feature, and is not always proof against the severity of our winters.

44. BUPLEURUM—(*Hare's-Ear*).

UMBELLIFERÆ—PENTANDRIA DIGYNIA.

1. *Bupleurum* FRUTICOSUM.—Spain, 1596. Evergreen shrub 4-6 feet. Leaves oblong, coriaceous, entire, sessile, of a glaucous bluish colour. Flowers yellow in umbels. It requires a rather sheltered situation, and is interesting as a type of a large order, nearly all the members of which are herbaceous. But, independent of this claim to notice, its sea-green leaves and bright yellow flowers render it desirable on its own merits. It will not prove hardy in our midland and northern counties.

45. BUXUS—(*Box*).

EUPHORBIACEÆ—MONCECLA TETRANDRIA.

1. *Buxus* BALEARICA.—Minorca, 1780. Evergreen tree 18-20 feet, but in its native places it is said occasionally to reach the height of 80 feet. Leaves much larger, and of a paler

green, than those of the common Box, but of a similar shape. Flowers diminutive, axillary. It is found with variegated leaves, and in this form it is considered a very handsome and desirable evergreen shrub.

2. *Buxus SEMPERVIRENS*.—England. Evergreen tree 15-20 feet. Flowers greenish yellow, axillary. It is a well-known tree, of very slow growth, but great longevity. It will bear clipping into almost any shape, and our ancestors used it extensively for that purpose. Who knows whether, in the mutations of fashion, the art of the topiary may not some day be again put into requisition, and our gardens may not once more be tenanted by leafy birds, dragons, and dolphins? Amongst the Romans this taste prevailed largely in the time of Martial, who alludes to the "tonsile" properties of the Box-tree;—and of the addiction of our forefathers to the practice some specimens still remain in old-fashioned grounds. The dwarf variety serves for border-edgings in almost every garden.

46. CALLUNA—(Heather).

ERICACEÆ—OCTANDRIA MONOGYNIA.

1. *Calluna VULGARIS* (var. FLORE PLENO).—England. Evergreen shrub 1-2 feet. This is the double-flowering variety of the common heather or ling, and it is a very beautiful object,—the stems being almost hidden by the numerous, large, double, pink flowers which profusely clothe them. The white-flowered variety also possesses claims to cultivation, but can hardly be so highly recommended. All the species require peat soil in order to thrive.

47. CALOPHACA.

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Calophaca WOLGARICA*.—Siberia, 1786. Shrub 2-3 feet. Leaves pinnate, leaflets 13-15, velvety beneath. Flowers yellow.

Pods reddish. When grafted on the Laburnum, it forms an interesting object, and even as a dwarf it is a pretty little shrub, though rather straggling in its habit.

48. CALYCANTHUS—(*Allspice*).

CALYCANTHACEÆ—ICOSANDRIA POLYGYNIA.

1. *Calycanthus* FLORIDUS.—Carolina, 1726. Shrub 6-8 feet. Leaves oval, rather downy beneath. Flowers solitary, of a dusky purple, on short peduncles, strongly scented. The wood of the trunk has a powerful smell of camphor. The leaves are large and numerous, so that the dark nearly sessile flowers do not easily catch the eye.

Calycanthus PRÆCOX. (See CHIMONANTHUS FRAGRANS.)

2. *Calycanthus* MACROPHYLLUS.—California, 1848. Shrub 8-10 feet. Leaves large, ovate, entire, glabrous. Flowers solitary, brownish-purple, odorous. This species has much larger leaves and grows more vigorously than the *C. Floridus*. It forms a well-shaped bush, densely clothed with handsome foliage.

49. CAMELLIA.

TERNSTRÓMIACEÆ—MONADELPHIA POLYANDRIA.

1. *Camellia* JAPONICA.—China, 1739. Evergreen tree 20-30 feet. Leaves coriaceous, ovate, acuminate, serrated, of a fine glossy green. Flowers axillary, sessile, white, red, or variegated. If protected the first two or three years after being planted out, and when once established, it proves in the climate of London quite as hardy as the common Laurel, and blooms as profusely as in a conservatory. It is true that, from its habit of flowering early in spring, the blossoms are some-

times damaged by the nipping easterly winds, but this only occurs in unfavourable seasons ; and, even if the tree never flowered at all, its lovely foliage would still make it one of the most beautiful evergreens of which our gardens can boast. A plant of the variety *Donkelarii* has stood out for twelve years in a garden at Forest Hill (near London), with a northern aspect, without the slightest protection during the severest winters, and now forms a good-sized bush, densely clothed with magnificent foliage. The *Camellia* ought to be planted out in every garden, and, with a little attention for the first year or two, it would prove quite hardy, at least in the more southern counties, and each season it would increase in attractiveness.

50. CARAGANA—(*Pea Tree*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Caragana* ARBORESCENS.—Siberia, 1752. Tree 15-20 feet. Leaves pinnate, leaflets 8-10. Flowers yellow, axillary. The wood is peculiarly hard and tough. This plant is quite hardy, and very free of flowering.

2. *Caragana* JUBATA.—Siberia, 1796. Shrub 1-2 feet. Leaflets 8-10, downy. Petioles spinose and persistent, so that, after the leaves have fallen, they impart to the plant a peculiar shaggy appearance. When grafted on the *C. arborescens*, it forms a curious object, almost unequalled for eccentricity of aspect.

3. *Caragana* SPINOSA.—Siberia, 1755. Shrub 3-6 feet. Leaflets 4-8. Flowers solitary, yellow. The stipules and petioles are very spiny. In China bushes of this plant are stuck in clay on the tops of walls, to prevent intrusion, just as broken bottles are used here for the same purpose.

51. CARPINUS—(*Hornbeam*).

CORYLACEÆ—MONÆCIA POLYANDRIA.

1. *Carpinus* AMERICANA.—N. America, 1812. Tree 20-25 feet. Leaves oval, acuminate, finely dentated. The trunk is large as compared with the height of the tree, and instead of being round is frequently curiously "fluted." The bark is smooth and spotted with white. It is very hardy, grows slowly, and has a peculiarly sturdy aspect.

2. *Carpinus* BETULUS.—England. Tree 40-60 feet. Leaves smooth, doubly serrated, pointed, plaited (especially in their early development), with numerous hairy ribs, nearly persistent during winter, and in form somewhat resembling those of the elm, whilst the spray is very similar to that of the beech. It bears clipping well, and hence is adapted, and frequently used, for forming dense hedges.

52. CARYA—(*Hickory*).

JUGLANDACEÆ—MONÆCIA 4-6-ANDRIA.

1. *Carya* ALBA.—N. America, 1629. Tree 70-90 feet. Leaves pinnate, leaflets 5-7, very large. The fruit is round, about $1\frac{1}{2}$ inch in diameter, with four seams or furrows; the kernel well-tasted, and much used as food by the Indians. The bark exfoliates in long narrow strips. This, like the other species of *Carya*, being rather coarse-rooted, should be planted young, as otherwise it with difficulty bears removal. But the beautiful foliage of these trees amply repays the care bestowed on them, and once fairly started into growth, they are quite hardy.

2. *Carya* AMARA.—N. America, 1800. Tree 60-70 feet.

Leaves pinnate, leaflets 7-9, the latter about 6 inches in length. The fruit is small, roundish ; the kernel bitter and inedible.

3. *Carya OLIVÆFORMIS*.—N. America, 1766. Tree 60-70 feet. Leaves pinnate, leaflets 13-15, the former 12-18 inches, and the latter 2-3 inches in length. Fruit oblong, with four slightly prominent angles. The shell is smooth and thin, and the kernel of pleasant flavour. It is a tree of slow growth, and very impatient of transplantation.

4. *Carya PORCINA*.—N. America. Tree 70-80 feet. Leaves pinnate, leaflets 5-7. Fruit round, roughish, of a beautiful green ; kernel difficult to extract on account of the hardness of the nut. The wood is hard, tough, and very strong. The fruit is used in swine-feeding ; and hence in America it is called the pig-nut. In America the wood of all the species is extensively used for cabinet-making purposes.

53. CASSANDRA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Cassandra CALYCVLATA*.—N. America, 1748. Evergreen shrub 2 feet. Leaves elliptic-oblong, rusty beneath. Flowers in long, recurved, leafy racemes, cylindrical, white. It thrives best in bogs or swamps, like many of the most beautiful of the Heath family, whilst, also like them, it produces an abundance of pretty bell-shaped flowers.

54. CASSIOPE.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Cassiope TETRAGONA*.—Lapland, 1810. Evergreen shrub 1 foot. Leaves adpressed, imbricated in 4 rows, and forming a

square column round the stem. Flowers axillary, bell-shaped, white. A lovely little plant, but difficult to keep through winter, as in its native habitat it is covered with snow during the cold season, and some similar protection appears requisite here during our frosts, which, although not nearly so intense as in Lapland, are not, as there, modified in their effects on plants by a permanent covering of snow.



CASTANEA VESCA—Spanish Chestnut—Swinly Park.

55. CASTANEA—(*Chestnut*).

CORYLACEÆ—MONŒCIA POLYANDRIA.

1. *Castanea CHRYSOPHYLLA*.—Oregon, 1854. Evergreen tree 20-40 feet. Leaves ovate-oblong, entire, $2\frac{1}{2}$ -3 inches long, acuminate, coriaceous, green above, golden yellow beneath. The catkins and fruit are very similar to those of the *C. vesca*. Its chief attraction (and that is a very powerful one) lies in the

bright golden hue of the under-surface of the leaves. Hitherto this species has been rare and costly, and there have been but few opportunities of testing its hardiness. There is, however, every reason to hope that it will thrive in the climate of South England, and largely contribute to embellish our landscapes.

2. *Castanea VESCA*.—Asia Minor, before 1548. Tree 60-80 feet. Leaves oblong-lanceolate, shining, serrated, from 5 to 8 inches long, of a beautiful light green. The fruit does not often come to maturity in this climate, but the tree is highly ornamental, of rapid growth and long-lived. Its beauty is at its height when it is adorned by its thousands of long, pendulous, light-green catkins. The variety called *V. asplenifolia* or *laciniata* is distinguished by the leaves being attenuated in different degrees, sometimes nearly to the midrib.

56. CATALPA.

BIGNONIACEÆ—DIANDRIA MONOGYNIA.

1. *Catalpa SYRINGÆFOLIA*.—N. America, 1726. Tree 50 feet. Leaves cordate, large (5-6 inches across), of a beautiful light green. Flowers in lax terminal panicles, white, with yellow and purple spots, and not very dissimilar in shape to those of the foxglove. Seed-pods very long, narrow and round, hanging gracefully and conspicuously after the leaves are shed. This very ornamental tree grows very rapidly, is perfectly hardy about London, and from the exceeding beauty of both its leaves and flowers deserves a prominent place in every collection. In Scotland it can scarcely be said to be hardy, for although it has there survived the frosts of winter, its growth is stunted. But as far north as Lancashire it seems to

thrive, and some handsome specimens exist in the North-midland counties.



CATALPA SYRINGÆFOLIA.

57. CEANOTHUS—(*Red Root*).

RHAMNACEÆ—PENTANDRIA MONOGYNIA.

1. *Ceanothus AMERICANUS*.—N. America, 1713. Shrub 4 feet. Leaves acuminate, serrated. Flowers in axillary bunches, white, abundant. A hardy and very pretty shrub, which flowers very profusely, and is less known than it deserves to be.

2. *Ceanothus AZUREUS*.—Mexico, 1818. Shrub 8-10 feet. Leaves obtuse, serrated, hoary beneath. Flowers light blue, in axillary bunches, very abundant. Fruit bluntly triangular. Not so hardy as the preceding, but perfectly so in the southern

counties if grown against a wall, on which it shows itself to advantage.

3. *Ceanothus* INTERMEDIUS.—Hybrid raised in England. Shrub 8-10 feet. Leaves ovate, serrated, pale green below, persistent and nearly evergreen. Flowers in axillary bunches, of a pale blue, abundantly produced. It approaches in most of its characteristics to the *C. azureus*, and being hardier, may be advantageously substituted for it. How far north it may be cultivable in the open air can only be ascertained by actual experiment.

58. CEDRUS—(*Cedar*).

CONIFERÆ—MONÆCIA MONADELPHIA.

1. *Cedrus* ATLANTICA.—North Africa, 1843. Tree 80-100 feet. Leaves chiefly in tufts, needle-shaped, acute, $\frac{1}{2}$ - $\frac{3}{4}$ inch long. Cones $2\frac{1}{2}$ -3 inches long, rather flattened, erect. Branches stout, more upright in their growth than the other species of cedar, especially whilst the trees are young. It is a very hardy tree, and of rapid growth—not quite so beautiful, perhaps, as the *C. Libani* and *Deodara*, but fitting company for them. The branches of the *C. Deodara* are pendulous, those of *C. Libani* horizontal, and those of the *C. Atlantica* rather erect.

2. *Cedrus* DEODARA.—Himalayas, 1822. Tree 140-180 feet. Leaves in tufts or bundles (except on the young shoots, where they are scattered), acute, 1-2 inches long, very glaucous when young, green when older. Cones not very different from those of the *C. Libani*. The branches are gracefully pendulous, especially in the young trees, but in respect both to this feature and to the hue of the foliage, there exist many gradations of difference between individuals raised from the same batch

of seedlings. This very ornamental tree grows rapidly, and but rarely suffers from our spring frosts and "Etesian easterlies."

3. *Cedrus* LIBANI.—Syria, 1683. Tree 60-80 feet. Leaves in tufts, sharp-pointed, 1 inch long, slender, dark grass-green. Cones erect, 4-5 inches long, persistent on the tree for several years. The branches are very large in proportion to the trunk, and form distinct horizontal layers or stages. In young trees the summit is spiry; old ones have a flattened tabular top, and the horizontal branches cover a very wide space. A well-known tree, of unrivalled majesty and grandeur when old, and beautiful even in the earlier stages of its growth.

59. CELTIS—(*Nettle Tree*).

ULMACEÆ—POLYGAMIA MONŒCIA.

1. *Celtis* AUSTRALIS.—S. Europe, 1796. Tree 40-50 feet. Leaves lanceolate, sharply serrated, unequal at the base, rough on the upper, downy on the under surface, and strongly marked with nerves beneath. Flowers small; fruit blackish, very pleasant and wholesome. The wood is very compact and highly esteemed; the root furnishes a yellow dye; the bark is used for tanning, and an oil is expressed from the stones of the fruit. Truly a most useful and interesting tree!

2. *Celtis* CRASSIFOLIA (the Hackberry).—N. America, 1812. Tree 60-80 feet. Leaves heart-shaped, acuminate, sometimes 6 inches long by 3-4 broad, and so abundant as to afford a delightful shade. Flowers small, white. Fruit round, of the size of a pea, blackish. The trunk is of small diameter as compared with the height of the tree. By some botanists it is called the *C. cordata*. The rapidity of its growth, the majestic

height it attains, and the beauty of its foliage, entitle it to far more attention than it has yet received, and it is probably the hardiest as well as the most beautiful of the species.

3. *Celtis OCCIDENTALIS*.—N. America, 1656. Tree 50-60 feet. Very similar in foliage to the *Australis*, but its leaves are much broader in proportion to their length. In other respects the difference between the two species is small; of the two the *C. Australis* is perhaps the preferable species.

60. CEPHALANTHUS—(*Button-wood*).

RUBIACEÆ—TETRANDRIA MONOGYNIA.

1. *Cephalanthus OCCIDENTALIS*.—N. America, 1735. Shrub 7-10 feet. Leaves ovate, acuminate. Flowers in a globular head, greenish-yellow, raised on long stout peduncles. A curious and interesting shrub, flowering very freely late in summer. It is very hardy, and worth growing for its pretty globular blossoms.

61. CEPHALOTAXUS.

CONIFERÆ—DICECIA MONADELPHIA.

1. *Cephalotaxus FORTUNII*.—Japan, 1848. Tree 60 feet. Leaves two-rowed, linear-lanceolate, flat, 2-3 inches long, glaucous and silvery beneath. Branches spreading, and finally rather pendulous. The above description applies to the male plant, in which the flowers are axillary, in small globular heads. The female tree has much smaller leaves, hardly more than one inch in length, and is altogether a far less elegant plant. The *F. mas.* attains a great height in its native country, but here, although apparently quite hardy, its rate of growth is so slow as to render it doubtful whether it will ever expand beyond

the dimensions of a large shrub. Is the so-called *C. drupacea* a separate species, or only the *C. Fortunii fœmina*?

62. CERASUS—(Cherry).

ROSACEÆ—ICOSANDRIA MONOGYNIA.

1. *Cerasus* CAROLINIANA.—Carolina, 1759. A small evergreen tree 20-25 feet. Leaves nearly sessile, lanceolate-oblong, pointed, smooth, and shining. Flowers in axillary upright racemes, white, numerous. Fruit small, black, inedible; and being persistent, the tree in spring is laden at once with fruit and with flowers. It flourishes in sheltered warm nooks near the sea, so that in the vicinity of London it is rather tender, and requires (and deserves) a wall or other protection. In the northern counties its out-door cultivation cannot be recommended.

2. *Cerasus* DEPRESSA.—N. America, 1805. Prostrate shrub, hardly 1 foot high, but spreading over a large space of ground in a curious manner. Leaves lanceolate, glaucous beneath. Flowers white, sessile, in small umbels. Fruit ovate, black, small, but of agreeable taste. In America it is called the sand-cherry. It departs from the normal form of shrubs in a greater degree than almost any other. A single plant will in a few years completely cover with its prostrate branches and shoots a rood of ground.

3. *Cerasus* LAUROCERASUS.—Anatolia, 1576. Evergreen shrub 20-40 feet, well known as the common Laurel. Leaves large, ovate, glossy, of a yellowish green, coriaceous. Flowers in axillary racemes. It is of very rapid growth, but suffers from severe frosts, and thus its development is occasionally checked. Its beauty and adaptation to purposes of ornament or shelter have rendered its cultivation all but universal. It thrives

quite as well in North Britain as in the climate of London, but in neither is it entirely proof against intense frost and easterly winds.

4. *Cerasus LUSITANICA*.—Portugal, 1648. Evergreen tree 20-40 feet. Leaves ovate-lanceolate, serrated, of a fine green and very glossy. Flowers in upright racemes. Berries oval; dark purple. It generally grows in the shape of a large bush, presenting a dense mass of foliage, and only assumes the tree form when carefully trained to a single stem. It commonly goes by the name of the Portugal Laurel. Very few evergreen shrubs equal it in beauty, and when once fairly established it is by no means of slow growth. In favourable seasons, and when of a fair size, it produces an abundance of flower-spikes and purple berries. There are some fine specimens in Scotland, which is a conclusive proof of its hardiness.

5. *Cerasus PADUS*.—England. (The Bird Cherry.) Tree, 20-25 feet. Leaves ovate-lanceolate, toothed, and odorous when bruised. Flowers white, in long drooping racemes, very ornamental, but of short duration, replaced by berries, which are handsome while they hang on the tree, but are too eagerly devoured by birds to last long.

6. *Cerasus SEMPERFLORENS*.—Native country unknown. Leaves ovate, serrated. Branches pendulous. It develops its gay white flowers almost continuously during summer. It produces a fine effect when grafted standard high on the common cherry-tree, as the fruit weighs down the shoot on which it is produced and hangs clear away from the branches in a peculiar and elegant manner.

7. *Cerasus VIRGINIANA*.—Virginia, 1724. Tree 50-60 feet. Leaves oblong, acuminate, thin, and glossy, 5 inches long. Flowers white, with round petals, in tall erect racemes. The foliage is peculiarly elegant, and lasts till winter is far

advanced. The fruit is black, very small, and not eatable. On the banks of the Ohio, specimens have been found 80 to 100 feet high, with proportionate trunks; but in more northerly regions it does not reach above 30 to 40 feet in height. The beauty of its foliage and flowers ought to bring this comparatively unknown tree into general notice and cultivation. It is of doubtful hardiness in our more northern counties.

8. *Cerasus* VULGARIS.—Europe, and if not indigenous to England, the date of introduction is unknown. As an ornamental tree, it is the double-flowering variety (*C. v. flore pleno*) that is best deserving of cultivation. This grows rapidly, though not to a great height (viz. 25-35 feet), and derives its chief claim to notice from its abundant pure white pendulous blossoms, which, in early spring, contrasting with the recent winter's gloom, dazzle us with their beauty.

63. CERCIS—(*Judas Tree*).

LEGUMINOSÆ—DECANDRIA MONOGYNIA.

1. *Cercis* SILIQUASTRUM.—S. Europe, 1566. Tree 20-30 feet. Leaves heart-shaped at base, round, smooth, and of a fine bluish-green colour. Flowers numerous, of a bright, purplish pink, which appear in early spring before the leaves are developed, clothing the branches and even the trunk. It finally assumes a flat, spreading form, and is very attractive at all seasons. Its growth is slow, and it requires care in transplanting. The peculiar position of its flowers (sessile along the stems), their abundance, and their delicate pink colour, render this a very attractive tree. In the climate of Scotland it is not hardy as a standard, but thrives well if trained to a wall.

64. CHAMÆCYPARIS—(*White Cedar*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Chamæcyparis* SPHÆROIDES (CUPRESSUS THYOIDES).—N. America, 1736. Tree 60-70 feet. Leaves imbricated, very short, of a glaucous green, with a gland on the back rib. Cones of the size of a pea, numerous clustered together. A very hardy tree, but of rather slow growth. The species with variegated leaves and branchlets is both more ornamental and of more rapid growth. Swamps are the natural habitat of this tree, which will not attain its full height unless in humid situations. Its timber is much prized in America for many useful purposes.



CHAMÆCYPARIS SPHÆROIDES.

65. CHAMÆROPS—(*Fan Palm*).

PALMÆ—POLYGAMIA DICECIA.

1. *Chamærops* EXCELSA.—China, 1822. Evergreen tree 20-30 feet. Leaves digitate, fan-shaped, of a bright green, growing from tufts of tough fibrous tissue. It will live (but not grow tall) in our climate, if placed in a sheltered spot and slightly protected during severely cold weather. It is quite worth this trouble to possess a representative of this glorious tribe of tropical trees, for though of slow growth, and never likely to attain here the majestic aspect it displays in its native clime, yet it prominently presents the distinctive features of its tribe in its

66 CHENOPODIUM (GOOSEFOOT)—CHIMONANTHUS.

fan-like foliage, etc. It would be useless to try it in the open air, except in our southern counties.

66. CHENOPODIUM—(*Goosefoot*).

CHENOPODIACEÆ—PENTANDRIA DIGYNIA.

1. *Chenopodium* FRUTICOSUM.—England, on the sea-coasts. Evergreen shrub 4 feet. Leaves linear, fleshy, of a glaucous green colour. Flowers greenish, inconspicuous. It is not an elegant plant, but is curious and interesting. Its succulent leaves are sometimes injured by frost, but it is never entirely killed, and the damage is soon repaired by fresh growth.

67. CHIMONANTHUS.

CALYCANTHACEÆ—ICOSANDRIA POLYGYNIA.

1. *Chimonanthus* FRAGRANS.—Japan, 1776. Shrub 8-10 feet. Leaves ovate-lanceolate, acuminate, smooth, of a light green colour. Flowers axillary, yellowish, with a purple tinge within, produced in winter (December to February), and most deliciously fragrant. To thrive and blossom well, it requires to be trained to a wall, which assistance no plant repays better, by the delightful perfume of its flowers, which seem to luxuriate in frost and snow. Its slowness of growth has probably interfered with its popularity, otherwise it is inconceivable that a shrub, bearing lovely and exquisitely odorous flowers in great abundance in the depth of winter, should not have a place in every garden, however small. It is sometimes improperly named *Calycanthus præcox*.

68. CHIONANTHUS—(*Snow-Flower or Fringe-Tree*).

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Chionanthus* VIRGINICA.—N. America, 1796. Tree 15-20 feet. Leaves large, lanceolate, smooth. Flowers in terminal racemes, white; the limb of the corolla cut into four long linear segments, which give the raceme the appearance of a fringed tuft. A beautiful small tree, ornamental in both its foliage and its flowers, and, though of slow growth, affording abundant blossoms when once fairly established.

69. CINERARIA.

COMPOSITÆ—SYNGENESIA SUPERFLUA.

1. *Cineraria* MARITIMA.—S. Europe, 1596. Evergreen shrub 3-4 feet. Leaves deeply sinuated, the lobes obtuse, white, with hoary down, especially beneath. Flowers in panicles; yellow; involucre downy. It is rather tender, but fully deserves a sheltered spot and some slight protection. It was a greater favourite with our forefathers than it appears to be of late with us, but, as in other cases, its turn for popularity may probably come again. It will hardly bear the severer frosts of our northern counties.

70. CISTUS—(*Rock Rose*).

CISTACEÆ—POLYANDRIA MONOGYNIA.

1. *Cistus* CYPRIUS.—Cyprus, 1800. Evergreen shrub 5-6 feet. Leaves oblong, lanceolate, dark green, smooth above, downy beneath. Flowers large, white, with a dark reddish-brown spot at the base of each petal, very ornamental. They only last one day, as the petals are very fugacious, but each day for a long time produces its successive crop of fresh blossoms.

This beautiful shrub is tolerably hardy when once established, and is a great adornment to any garden. It is commonly known by the name of *C. ladaniferus*, which is, however, quite a different plant. It is also known as the Gum Cistus.

2. *Cistus* LAURIFOLIUS.—Spain, 1771. Evergreen shrub 4-5 feet. Leaves ovate-lanceolate, smooth above, downy beneath, stalks dilated. Flowers white, showy, abundant, clothed with light red ornamental bracts. One of the hardiest and most robust species of the tribe, and well deserving cultivation.

3. *Cistus* PURPUREUS.—Levant, 1596. Evergreen shrub 3-4 feet. Leaves oblong, lanceolate, somewhat wrinkled, with wavy margins. Flowers large, reddish-purple, with a yellow spot at the base, over which is a dark red mark. Petals overlapping, much crumpled, and very fugacious. This handsome shrub is rather delicate, and requires to be planted near a wall or other shelter.

There are upwards of thirty other species of *Cistus* introduced into England, all of them more or less ornamental, but they are so tender and so liable to be killed by even a moderate winter, as to render their cultivation unsatisfactory and disappointing.

71. CLEMATIS—(*Virgin's Bower*).

RANUNCULACEÆ—POLYANDRIA POLYGYNIA.

1. *Clematis* FLAMMULA.—France, 1596. Climbing shrub. Leaves pinnate, leaflets of various forms. Flowers white, very abundant, and exceedingly fragrant. It grows very rapidly, and quickly covers trellis-work, etc., with its tendril-like leaves. Whether for adorning a cottage porch, or roofing a trellised arcade, or screening an unsightly corner, the beauty and fragrance of this favourite plant is always available.

2. *Clematis* FLORIDA.—Japan, 1776. Climbing shrub. Leaves ternate, leaflets ovate, acute. Flowers white, rather large. Its neat foliage and slender stems render it a desirable plant. The single-flowered variety is preferable to that with double flowers.

3. *Clematis* LANUGINOSA.—China, 1852. Climbing shrub. Leaves mostly simple, but a few ternate, very large, cordate-ovate, acuminate, entire, downy beneath. Flowers pale lilac, of magnificent dimensions, abundantly produced, and succeeding each other for two or three months. Nothing can exceed the gorgeous beauty of this plant, and as it is quite hardy and free-growing, there is no excuse for its exclusion from any collection.



CLEMATIS LANUGINOSA.

4. *Clematis* VITICELLA.—Spain, 1669. Climbing shrub. Leaves ternate, leaflets entire. Flowers blue or purple, on long slender peduncles (which makes them very conspicuous) and very copiously produced. It grows rapidly, and is very showy; but, unfortunately, it is not long-lived.

Hybrid varieties (such as *C. Jackmanni*, etc.) are excluded from the scope of this work; but several of them are highly ornamental, from the shape and size as well as from the brilliant colouring of their flowers.

72. CLETHRA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Clethra* ALNIFOLIA.—N. America, 1731. Shrub 4-5 feet. Leaves obovate, acute, serrated. Flowers in erect racemes,

white, very fragrant, produced in autumn. It is a very ornamental shrub, with sweet-scented flowers, but requires a peat-soil to thrive well. It blooms late, and is in its prime when most shrubs have shed their flowers.

2. *Clethra* TOMENTOSA.—N. America, 1731. Shrub 4-5 feet. It is very similar to the *C. alnifolia*, except that the leaves are more finely serrated, and have a white down beneath, the racemes also are downy. Of the two species, the latter is perhaps slightly preferable, but either will prove an ornament to any garden.

73. COLLETIA.

RHAMNACEÆ—PENTANDRIA MONOGYNIA.

1. *Colletia* HORRIDA.—Chili, 1832. Shrub 3-4 feet. Leaves very few, small, and fugacious. Stems and shoots terminating in very strong awl-shaped spines. Flowers reddish-yellow, bell-shaped. A very curious shrub, quite worth cultivation, and hardy in dry situations. There is another species (*C. cruciata*) still more eccentric in its aspect, but not so hardy. This is a great pity, for it is an interesting plant and bears an abundance of bell-shaped flowers late in autumn. The out-door cultivation of the *Colletias* must be confined to our southern counties, as they will not resist very severe frosts.

74. COLUTEA—(*Bladder Senna*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Colutea* ARBORESCENS.—South Germany, 1570. Shrub 12-15 feet. Leaves pinnate, leaflets 7-11. Flowers in racemes of 5 or 6 blooms, yellow, which are succeeded by curious bladder-legumes, which are sufficiently air-tight to explode, when pressed, with a noise. A quick growing and very hardy

shrub. The inflated seed-pods impart to the plant a very distinctive character.

75. COMPTONIA.

MYRICACEÆ—MONŒCIA TETRANDRIA.

1. *Comptonia ASPLENIFOLIA*.—N. America, 1714. Shrub 4-5 feet. Leaves linear-oblong, cut into numerous small rounded lobes. Catkins sessile; fruit bristly. Its numerous, fern-like leaves are very ornamental, and, when grown in peat, it is a beautiful shrub, with long spreading twiggy branches. The leaves, when crushed, give out a resinous scent. It is very hardy, but will not thrive well unless planted in peat soil.

76. COREMA.

EMPETRACEÆ—DIOECIA TRIANDRIA.

1. *Corema ALBA*.—Portugal, 1774. Small evergreen shrub 1 foot. In almost every respect resembling the *Empetrum nigrum* (which see), except that the berries are white. But whereas the *Empetrum* is a native of cold climates, whilst the *Corema* inhabits the "sunny south," the latter requires, in order to thrive, not only a peat-soil but a sheltered and sunny situation, and the range of its cultivation must be confined to the south and west of England.

77. CORIARIA.

OCHNACEÆ—DIOECIA DECANDRIA.

1. *Coriaria MYRTIFOLIA*.—S. Europe, 1629. Shrub 6 feet. Leaves ovate-lanceolate, three-nerved, somewhat resembling those of the myrtle. Flowers small, greenish, in upright racemes. It sometimes dies to the ground, but it in that case

generally pushes up vigorous shoots from the roots, and may therefore be looked upon as hardy. The berries are said to be poisonous. It is of doubtful hardiness north of the Trent.

78. CORNUS—(*Dogwood*).

CORNACEÆ—TETRANDRIA MONOGYNIA.

1. *Cornus* ALBA.—N. America, 1741. Shrub 10-12 feet. Leaves ovate, acute, pubescent, hoary beneath. Flowers white, in corymbs. Berries white, contrasting finely with the bright red colour of the stems and shoots. This latter peculiarity, indeed, constitutes its principal merit.

2. *Cornus* FLORIDA.—N. America, 1731. Tree 20-30 feet. Leaves large, ovate, acuminate, pale beneath, and somewhat hairy. Flowers yellowish, small, in bunches, surrounded by a large involucre of four petaloid leaves of a fine white colour, sometimes inclining to violet. These involucres constitute the floral beauty of the tree, and entitle it to our admiration. It is, however, rather capricious, and does not thrive everywhere, but succeeds best in a peat-soil. The bark was once supposed to rival the virtues of Peruvian bark, but it has fallen into disuse, like many other "simples," in which our ancestors (with more or less of wisdom) placed implicit reliance. If it cured, what boots it now to inquire how much was owing to the therapeutic virtues of the drug, and how much to the quickening power of the patient's imagination?

3. *Cornus* MASCULA (Cornel Tree).—Germany, 1596. Shrub 15-20 feet. Leaves oval, acuminate, somewhat pubescent. Flowers yellow, in umbels, expanding very early before the leaves. Fruit bright scarlet, olive-shaped, very ornamental, but not produced very abundantly.

79. CORONILLA.

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Coronilla* EMERUS.—S. Europe, 1596. Shrub 8-10 feet. Leaves pinnate, leaflets 9-15. Flowers yellow when expanded, but the corolla is externally red just before opening. It is a very pretty shrub, thickly clothed with branches, forming a nice round bush, and the flowers, though small, are very abundant. It is doubtful how far it would stand the climate of our northern counties.

80. CORYLUS—(*Hazel*).

CORYLACEÆ—MONŒCIA POLYANDRIA.

1. *Corylus* AVELLANA.—England. Shrub (or low tree) 20-30 feet. Leaves heart-shaped, pointed, of a darkish green, and slightly downy. There are several varieties in respect to fruit which do not come within the scope of this work, but as regards ornamental appearance, the following are the most noteworthy, viz.—

A. purpurea.—Leaves of a fine dark purple, as also the calyx of the fruit.

A. heterophylla (or *urticifolia*).—Leaves variously cut, and beset with hairs.

A. crispa.—Calyx elongated and curiously cut into numerous curled segments. It is commonly called the frizzled filbert.

2. *Corylus* COLUMNNA.—Asia Minor, 1665. Tree 50-60 feet. Leaves heart-shaped, roundish-ovate, rough; nuts small, enveloped in the long, double, cut, and fringed calyx. It forms a handsome tree with a whitish bark, which peels off in strips, is very hardy, of rapid growth, and the leaves are large and

abundant. There is a tree of it at Syon, near London, which is between 60 and 70 feet high, of noble appearance. It quite deserves to be freely cultivated, whereas it is almost unknown. Although hardy in the vicinity of London, it may probably not prove so in the north of England, but it would be quite worth a trial.

81. COTONEASTER.

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Cotoneaster* FRIGIDA.—Nepal, 1824. Tree 15-20 feet. Leaves elliptical, crenulated, smooth, with a mucronate tip. Flowers white in terminal panicles, abundant and showy. Fruit bright red. The leaves fall off late, and some remain on the tree all the winter, as well as the fruit. It is very hardy.

2. *Cotoneaster* MICROPHYLLA.—Nepal, 1824. Low trailing evergreen shrub. Leaves small, oblong, leathery, pubescent beneath. Flowers white, contrasting finely with the deep-green, glossy foliage. Fruit red; abundant. Its prostrate habit causes it in time to cover a large space of ground, and it is specially adapted for ornamental rock-work.

3. *Cotoneaster* THYMIFOLIA.—Nepal, 1845. Trailing evergreen shrub. Leaves small, obovate, glossy above, hairy beneath, densely packed on the branches and shoots. Flowers white, solitary, small. The leaves are of a lighter green and less leathery than those of the *C. microphylla*. Its leafy creeping stems also form a denser cover. Both are very beautiful and useful plants.

82. CRATÆGUS—(*Thorn*).

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Cratægus* ARONIA.—Levant, 1810. Tree 20-30 feet. Leaves wedge-shaped at base, cleft into lobes more or less deep, which are toothed at their extremities. Fruit large, yellow, abundantly produced, making excellent tarts.

2. *Cratægus* AZAROLUS.—S. France, 1650. Tree 20-25 feet. Leaves wedge-shaped at base, trifid, rather pubescent. The flowers are white, as are those of almost every species of *Cratægus*. Fruit roundish, scarlet, eatable, though somewhat acid.

3. *Cratægus* COCCINEA.—N. America, 1683. Tree 20-30 feet. Leaves large, cordate-ovate, somewhat lobed, acutely serrated. Flowers white, large. Fruit scarlet, large, eatable. A fine free-growing species. Some individuals are almost spineless, whilst others bear spines of a very large size; so true it is that this character is of little value in determining or defining specific differences.

4. *Cratægus* CORDATA.—N. America, 1738. Tree 20-30 feet. Leaves cordate-ovate, of a fine glossy green. Flowers abundant; fruit small. It assumes a very round compact form, when growing freely, but in some situations it does not thrive very well.

5. *Cratægus* CRUS-GALLI.—N. America, 1691. Tree 15-20 feet. Leaves obovate, wedge-shaped, glossy, and so late in falling as to make the species sub-evergreen. Fruit small, scarlet. Spines very long, whence it is called the "Cock's-spur thorn." The following variety of it is particularly curious and interesting—viz. *C. salicifolia*: leaves nearly lanceolate, but the lower part wedge-shaped. The branches grow quite horizontally instead of upright, so as to form a flat head on the stem,

at that point (higher or lower) at which they are allowed to grow or are grafted. It deserves a place in every garden.

6. *Cratægus MACRACANTHA*.—N. America, 1819. Tree 20-30 feet. Leaves ovate-oblong, large, slightly lobed, serrated. Fruit red, rather small. Remarkable for its numerous and very long spines and for its vigorous growth.

7. *Cratægus MEXICANA*.—Mexico, 1824. Tree 20-30 feet. Leaves large, lanceolate-ovate, slightly indented and serrated, falling off very late. Fruit very large, yellowish-green, resembling a small apple, but not eatable.

8. *Cratægus OXYACANTHA*.—England. Tree 20-30 feet. This is the well-known common hawthorn, and it requires neither description nor eulogium here, but there are several of its varieties that deserve both, viz.—

O. aurea. Fruit of a golden yellow, and produced abundantly.

O. multiplex. Flowers double, of a beautiful pink colour, very numerous.

O. punicea flore pleno. Flowers dark red and double.

O. pendula. Branches drooping and hanging down almost perpendicularly.

O. præcox (the Glastonbury thorn). Leaves expanding in winter, sometimes late in autumn, and then blooming about Christmas.

O. flexuosa. The smaller branches tortuous and twisted in a zig-zag form.

9. *Cratægus PARVIFOLIA*.—N. America, 1713. Shrub 8-10 feet. Leaves ovate, serrated, nearly entire, small, somewhat pubescent. Flowers mostly solitary. Fruit rather large, roundish-ovate, of a yellowish green.

10. *Cratægus PUNCTATA* (variety *Rubra*).—N. America, 1746. Tree 20-25 feet. Leaves obovate, wedge-shaped. Fruit

red, dotted. The wood in this species is exceedingly hard, and the Indians make wedges of it for splitting trees.

11. *Crataegus PYRACANTHA*.—S. Europe, 1629. Evergreen shrub 8-12 feet. Leaves oval-lanceolate, small, entire, crenated, glossy. Fruit scarlet, globose, very abundant, and remaining on the tree all the winter. It is very hardy, and forms an ornamental bush, densely clothed with evergreen foliage, and profusely adorned with summer flowers and winter fruit.

12. *Crataegus SPATHULATA*.—Carolina, 1806. Tree 12-15 feet. Leaves in clusters, oblong, wedge-shaped, mostly 3-lobed, or else more or less indented, of a deep shining green, and mostly accompanied by large stipules. Fruit small. The growth is not rapid, but it forms a neat tree, and the foliage is very distinct.

13. *Crataegus TANACETIFOLIA*.—Levant, 1789. Tree 20-30 feet. Leaves deeply but irregularly cleft, hairy. Fruit large, globular, ribbed, of a yellowish green, eatable. The shape of the tree differs from all the other species in being very upright and fastigate. The shoots generally terminate in thorny points, and there is something very original in the whole aspect of the plant.

83. CRYPTOMERIA—(*Japan Cedar*).

CONIFERÆ—MONCECIA MONADELPHIA.

1. *Cryptomeria ELEGANS*.—Japan, 1863. Tree (probably) 20-30 feet. Leaves needle-shaped, subulately curved and pointed, placed singly and sparsely on all sides of, and at right angles to, the shoots. Branches numerous, horizontal, and when fully grown drooping at the extremities. Cones small, globular. The foliage gets terribly browned, indeed almost blackened, in winter; but this effect appears to be constitutional, not morbid, as the plant does not exhibit any symptom of having suffered,

and shoots again vigorously in May. It is a plant of almost unique appearance, and what we know of it stimulates our desire to know more. It has all the delicacy of appearance belonging to a tender exotic, and yet, as far as our experience goes, our winter leaves it browned, but uninjured. It would, however, be dangerous to rely on its hardiness in the more northern parts of our island.

2. *Cryptomeria* JAPONICA.—Japan, 1846. Tree 60-80 feet. Leaves in five rows, sharp-pointed, close together, rather spreading, about $\frac{1}{2}$ -inch long, of a bright green. Branches spreading, and somewhat pendulous. Cones globular. A very handsome tree, but in exposed situations it is apt to have its leaves browned in winter, and the branches get blown to one side by strong winds. In a sheltered spot no tree can surpass it in beauty. The variety *J. Lobbii* (or *viridis*) is of smaller size, more compact habit, and the leaves are of a still brighter green; but it cannot compete in beauty with the species.

* 84. CUNNINGHAMIA.

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Cunninghamia* SINENSIS.—China, 1804. Tree 30-40 feet. Leaves lanceolate, flat, pointed, bent downwards, $1\frac{1}{2}$ inch long, two-rowed on the old branches, but copiously scattered elsewhere. Cones drooping, globose, about 1 inch in diameter. It is a very elegant and distinct tree, which, although its foliage is browned by severe frost, is quite hardy in the south of England, except in very exposed situations. It bears considerable resemblance to the *Araucaria Braziliensis* (which is quite tender in our climate), and, whilst possessing equal beauty, has the additional merit of being hardy. How far north of London this species will resist the cold of winter has still to be ascertained; but we believe plants are to be found in some parts of Scotland.

85. CUPRESSUS—(*Cypress*).

CONIFERÆ—MONCECIA MONADELPHIA.

1. *Cupressus FUNEBRIS*.—China, 1849. Tree 40-50 feet. (The Weeping or Funereal Cypress of the Chinese.) Leaves thickly set, four-rowed, clasping the stem at the base, glaucous. Branches upright and rigid when the tree is young, giving it at that stage a pyramidal shape. This habit is quite altered when the tree has attained some age, the branches becoming pendulous, with graceful curves of inimitable elegance. It is hoped that this tree may prove hardy in the southern parts of England, but there has hardly been time to fully test its merits in this respect. At all events, we do not at present know, in this country, of a single large specimen of the plant.

2. *Cupressus LAWSONIANA*.—California, 1852. Tree 60-80 feet. Leaves in alternate opposite pairs, closely adpressed, of a glaucous green. Branchlets slender, flattened, thickly clothed with leaves gracefully pendulous, the leading shoot (as in the cedars) drooping till the ensuing season's growth. Cones of the size of a large pea, with a glaucous bloom while young. This is one of the most beautiful trees of a beautiful tribe. It is very hardy, a rapid grower, and should find a place in every collection. It is frequently so laden with its beautiful cones (which, however, have more the appearance of berries) that the fruitful branchlets are quite borne down by the weight, like the boughs of a prolific apple-tree. Nothing can be more graceful or attractive.

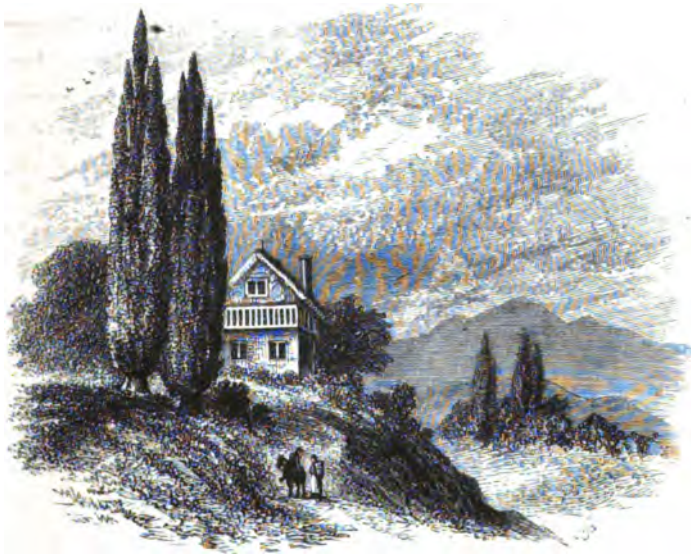
3. *Cupressus MACROCARPA* (or *LAMBERTIANA*). California, 1847. Tree 50 feet. Leaves imbricated, in four rows, of a bright grass-green. Branches starting horizontally from the stem, then more upright; but the tree, when full-grown, is flat-topped like the cedar of Lebanon. Cones in clusters $1\frac{1}{2}$ inch by 1 inch. A very fine tree, remarkable for the lively grass-

green of its foliage. Care must be taken not to allow more than one leading shoot, and to pinch off the tops of its weaker rivals, as otherwise not only the growth of the tree is retarded, but the snow is apt, by its weight amongst the bifurcations, to break off one or two of the competing "leaders," and thus the tree becomes disfigured. This remark applies to most species of the Cupressus, Thuja, and Juniperus tribes. The two salient points of this elegant tree are—the beautiful light grass-green of the foliage, by which it is easily distinguished from all its congeners; and, secondly, the rapidity of its growth, which is quite extraordinary whilst attaining adolescence, but diminishes as the tree approaches maturity. When near its complete development, the shoots assume the horizontal instead of the vertical tendency, and hence it acquires some similarity to the form of the cedar of Lebanon. Whether this species can be acclimatised in the northern parts of Britain must be a matter for experiment, and it is well worth the trial.

4. *Cupressus* NUTKAENSIS (or THUJOPSIS BOREALIS).—N.W. America, Nootka Sound, 1850. Tree 60-80 feet. Leaves four-rowed, decurrent, $\frac{1}{8}$ of an inch long, very sharp pointed, of a glossy green. Branchlets in two rows, flattened. Cones, globular, about the size of a large pea, covered with a glaucous bloom. A fine tree, with spreading or somewhat pendulous branches, and a very fit companion for *Cupressus Lawsoniana*, *Thuja Lobbii*, and *Thuja gigantea*, all of which, although sufficiently distinct, have a somewhat similar habit of growth, and each of which has its own peculiar charm. So far, this beautiful species has proved quite hardy.

5. *Cupressus* SEMPERVIRENS (or PYRAMIDALIS).—S. Europe, 1548. Tree 50-60 feet. Leaves imbricated in four rows, very small, convex, closely pressed to the stem, of a shining green, and very persistent. Cones globular, 1 inch in diameter.

Branches upright, and growing close to the stem. There is a variety (*S. horizontalis*) in which the branches are spreading, and from its appearance might be considered quite a distinct species, were it not that the seeds of the latter produce plants of the former. The timber is renowned for its durability.



CUPRESSUS SEMPERVIRENS—Common Cypress.

86. CYDONIA—(*Quince*).

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Cydonia* JAPONICA.—Japan, 1815. Shrub 5-6 feet. Leaves oval, crenated, smooth, with large stipules. Flowers bright red, abundant, expanding early. Fruit fragrant, but not eatable. As a bush, it wants compactness, but, trained, it will grow to the height of 12 or 15 feet, and form a beautiful object. The white-flowering variety is equally handsome,

and an intermixture of the two affords a charming *coup d'œil* in early spring. The thorough hardiness of this species (formerly known as the *Pyrus Japonica*) has made it very popular, and spread its culture over all parts of the island.

2. *Cydonia* VULGARIS.—Germany, 1573. Tree 20-25 feet. Leaves ovate, entire, green above, downy beneath. Flowers large, white, or pale red. The fruit, well known as the Quince, is large, globular or oblong, of a deep yellow or orange colour when ripe. The leaves, flower, and fruit are all very ornamental. The variety *V. Lusitanica* is the most elegant of all the forms assumed by this tree, and is entitled to a preference over the rest as a mere object of ornament.

87. CYTISUS—(*Broom*).

LEGUMINOSÆ—MONODELPHIA DECANDRIA.

1. *Cytisus* ALBUS.—Portugal, 1752. Shrub 15-18 feet. Leaves trifoliolate, leaflets silky. Flowers white and very abundant, rendering it in May one of the most striking ornaments of the garden. It should have a place in the smallest collection, as, while it occupies but a small space, and is an elegant shrub irrespective of its inflorescence, it is, during the fortnight it lasts in blossom, quite a dazzling spectacle. It is commonly called the White Broom.

2. *Cytisus* ALPINUS.—Apennines, 1596. Tree 40-50 feet. Very similar to the common Laburnum, but it grows more vigorously, the leaves are larger and of a deeper green, the racemes of flowers are also larger (though perhaps not so abundant), and the tree is more densely clothed with branches and foliage. It is usually distinguished by the name of Scotch Laburnum.

3. *Cytisus* LABURNUM.—S. Germany, 1596. Tree 30-40 feet. Leaves pinnate, petiolate. Flowers yellow, numerous,

in pendulous racemes. The Laburnum is too well-known a favourite to need recommendation. It is a pity that its habit of growth is so ungraceful. This bears the same relation to its pride of beauty during the short time it is in blossom, as the peacock's screech does to its plumage. It is well to note that the seeds are poisonous, and that, from their resemblance to small beans, children have often been induced to eat them, in many cases with fatal effect.

4. *Cytisus* PATENS.—Portugal, 1752. Shrub 6-8 feet. Leaves similar to those of the common broom, but flowers larger and in pairs, and branches striated and pubescent. Very showy and of a more delicate tint than the bright flaring yellow of the common *C. scoparius*.

5. *Cytisus* PURPUREUS.—Carniola, 1792. A trailing shrub, with ternate leaves, chiefly remarkable for its numerous purple, solitary, axillary flowers. Grafted on a standard *Cytisus laburnum* it has a charming effect, as the pale purple colour of the flowers gives it a quite distinctive appearance.

6. *Cytisus* WELDENI.—Dalmatia, 1838. Shrub 4-6 feet. Leaves in threes, leaflets obovate. Flowers similar to those of the *C. laburnum*, but the racemes are upright instead of pendulous. It is a shrub of slow growth with few branches, and its erect racemes form its only claim to notice.

88. DABŒCIA—(*Irish Heath*).

ERICACEÆ—OCTANDRIA MONOGYNIA.

1. *Dabœcia* POLIFOLIA (or *MENZIESIA* POLIFOLIA).—Ireland. Evergreen shrub 1-2 feet. Leaves elliptic, large, very dark green, with white tomentum beneath. Flowers large, in terminal racemes, somewhat globular, purple. Very ornamental, as also is the variety with white flowers. In peat it grows and

blooms most freely, and has all the elegance of a heath, with much larger leaves and flowers.

89. DACRYDIUM—(*Huon Pine*).

CONIFERÆ—DICECIA MONADELPHIA.

1. *Dacrydium* FRANKLINII.—Tasmania, 1844. Tree 80-100 feet. Leaves scale-formed, imbricated, of a fine glossy green. Fruit drupaceous, small, in terminal spikes. Branchlets long, slender, and pendulous. A lovely tree, but rather tender even in our southern counties. Specimens are known to have lived near London through some winters, but longer experience is required to pronounce definitely as to its comparative hardiness. It is of slow growth. Its timber is said to be "excellent for naval purposes." But it is hardly probable that it will ever attain any great bulk in this climate. The other *Dacrydiums* are unfortunately (for they are all beautiful) too tender for open-air culture.

90. DAPHNE.

THYMELÆACEÆ—OCTANDRIA MONOGYNIA.

1. *Daphne* CNEORUM.—Switzerland, 1752. Evergreen shrub 1 foot. Leaves lanceolate, smooth. Flowers in terminal umbels, sessile, pinkish, very fragrant. Berries white, rarely produced in England. The stems are procumbent, for which reason it is well adapted for rock-work. In peat-soil it thrives vigorously, and produces its beautiful flowers in profusion. It is sometimes called the Garland-flower.

2. *Daphne* COLLINA.—Candia, 1752. Evergreen shrub 4-5 feet. Leaves obovate, glossy above, hairy beneath. Flowers in terminal clusters, pale pink, very fragrant, frequently expanding in December, and continuing in succession throughout

the winter, at which period its abundant odorous blossoms are peculiarly acceptable. It is of doubtful hardiness north of the Trent.

3. *Daphne GNIDIUM*.—Spain, 1797. Evergreen shrub 2-3 feet. Leaves linear-lanceolate. Flowers in terminal panicles, pink, fragrant. Berries small, red, globular. The flowers are pretty, and the plant generally is very attractive. Its cultivation, however, is not easy, and it requires a peat-soil and a sheltered situation even near London. In the northern counties severe frosts would destroy it.

4. *Daphne LAUREOLA* (Spurge Laurel).—England. Evergreen shrub 4-6 feet. Leaves ovate-lanceolate, glossy, of a lively green. Flowers in short axillary clusters, of a yellowish green, produced in early spring. Berries black when ripe. It is a desirable shrub in plantations, from its thriving well under the drip of trees.

5. *Daphne MEZEREUM*.—England. Shrub 6 feet. Leaves lanceolate. Flowers sessile, numerous, thickly clothing the branches, pale lilac, fragrant, expanding in February before the leaves. Berries scarlet, glossy, but (as also the bark) acrid and poisonous. It is of easy culture in loamy soil, and has always been a favourite ornament to our gardens.

6. *Daphne PONTICA*.—Asia Minor, 1759. Evergreen shrub 6-7 feet. Leaves oval-lanceolate, smooth, of a pleasant light green. Flowers in upright clusters, yellowish, fragrant. This beautiful plant requires some protection, which, as it will stand the drip of trees, might be afforded by placing it in shrubberies or thickets. It thrives best in peat-soil. It is only in the southern parts of our island that it can be expected to outlive the winter.

91. DESFONTAINEA.

GENTIANACEÆ—PENTANDRIA MONOGYNIA.

1. *Desfontainea* SPINOSA.—Peru, 1850. Evergreen shrub 8-10 feet. Leaves irregularly ovate, waving, spiny-toothed, of a dark glossy green, so much resembling those of the common holly as to be easily mistaken for them. Flowers tubular, 1 inch in length, light scarlet, very ornamental. A curious and beautiful shrub, which has hitherto proved hardy in the climate of London, and, when more plentiful and accessible, may in some degree supplant the holly, which it equals in its foliage and far surpasses in size and beauty of inflorescence. The berries of the holly, however, fully make up for the inferiority of its flowers, for they endure all through winter and are associated with the most festive scenes in common English life—the life of the millions.

92. DESMODIUM.

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Desmodium* PENDULIFLORUM.—Himalayas, 1863. Shrub 3-4 feet. Leaves pinnate, leaflets three, elliptic, entire, of a lively green above, paler beneath. Flowers rich violet, in long pendulous racemes. If this beautiful shrub should prove hardy, as is confidently expected, or, at all events, should it stand our climate with some slight protection, it will prove a valuable addition to our floral treasures, as it flowers with such profusion as literally to hide its drooping branches. By some botanists it is named *D. racemosum*.

93. DEUTZIA.

PHILADELPHACEÆ—DECANDRIA TRIGYNIA.

1. *Deutzia GRACILIS*.—Japan, 1835. Shrub 3-4 feet. Leaves lanceolate, dentated, smooth. Flowers white, in axillary panicles, developed in early spring so as sometimes to suffer injury from cold easterly winds, in which case the petals are imperfectly developed. But in fine seasons, or when protected, few shrubs exceed it in beauty. It is frequently forced under glass, to adorn conservatories, etc., in February and March, and few flowering shrubs have greater aptitude for that treatment. It is not suited for outdoor culture in our northern counties, being less hardy than the next species (*D. scabra*), which is itself of doubtful hardiness much north of London.

2. *Deutzia SCABRA*.—Japan, 1832. Shrub 8-10 feet. Leaves ovate-acuminate, dentated, with stellate hairs, well worth microscopical inspection. Flowers white, in panicles, very abundant and ornamental. There is a variety of the *D. crenata* with double flowers which possesses still greater attractions, as, with equal abundance of blossom, the flowers are larger, more showy, and the sepals have a tinge of elegant light pink. The species itself has not the same pretensions to beauty.

94. DIERVILLA.

CAPRIFOLIACEÆ—PENTANDRIA MONOGYNIA.

1. *Diervilla CANADENSIS*.—N. America, 1729. Shrub 3-5 feet. Leaves ovate-acuminate, serrate. Flowers yellow, in axillary short racemes. Fruit a capsule, flask-shaped, brown. A hardy little shrub of moderate pretensions to beauty, and

eclipsed by its near relation, the *Weigelia*, but the colour of its flowers (yellow), being unusual in plants of this family, entitles it to notice.

95. DIOSPYROS—(*Date Plum*).

EBENACEÆ—POLYGAMIA DICECIA.

1. *Diospyros* LOTUS.—Caucasus, 1597. Tree 30-40 feet. Leaves oblong, acuminate, downy beneath, dark glossy green above. Flowers small, reddish white. Fruit yellow, about the size of a cherry, used in the East as a conserve.

2. *Diospyros* VIRGINIANA.—N. America, 1629. Tree 40-50 feet. Leaves ovate-oblong, acuminate, smooth, 4-5 inches long. Flowers small, pale yellow. Fruit larger than that of *D. lotus*, reddish, edible, but not very palatable. In America it is called the Persimon. Both species are slow of growth, and their graceful foliage forms their chief recommendation, as they rarely fruit in our climate, and the fruit when produced is of little value.

96. DIOTIS.

CHENOPODIACEÆ—MONECIA TETRANDRIA.

1. *Diotis* CERATOIDES.—Siberia, 1780. A semi-procumbent shrub 2-3 feet. Leaves lanceolate, covered as is the rest of the plant with hoary pubescence. Flowers inconspicuous, especially the female ones. It is well adapted for rock-work, and forms one of a curious and not large class of plants, distinguished for their tendency, more or less developed, to secrete a white mealy powder on their leaves.

97. DIRCA—(*Leather-wood*).

THYMELÆACEÆ—OCTANDRIA MONOGYNIA.

1. *Dirca* PALUSTRIS.—Virginia, 1750. Shrub 5-6 feet. Flowers yellow, produced in spring before the leaves. Its habit of growth is that of a small tree. The bark and wood are peculiarly tough. It requires moist peat-earth to thrive in, but at best is of very slow growth, and is more curious and interesting than elegant or showy.

98. ELÆAGNUS—(*Wild Olive*).

ELÆAGNACEÆ—TETRANDRIA MONOGYNIA.

1. *Elæagnus* ARGENTEA.—Hudson's Bay, 1813. Shrub 12 feet. Leaves oval-oblong, covered with silvery scales. Flowers small. Fruit ovate, the flesh dry, edible, about the size of a small cherry. It is a dicecious shrub, bearing the staminiferous and pistilliferous flowers on different plants. The male plant is the most ornamental.

2. *Elæagnus* HORTENSIS.—S. Europe, 1633. Tree 20-30 feet. Leaves lanceolate, very hoary, as are the annual shoots, whence the tree bears a remarkable silvery appearance. Flowers numerous, axillary, yellowish. Fruit of a reddish-brown colour. Branches spiny. It is not very hardy, and would no doubt suffer from the occasional rough weather of our northern counties.

3. *Elæagnus* PARVIFOLIA.—North India, 1842. Shrub 15-20 feet. Leaves lanceolate-ovate, bright green above, grey with silvery scales below. Flowers greenish, axillary. Berries abundant, which are, as well as the stems and all parts of the plant, except the upper surface of the leaves, of a glossy grey

90 EMPETRUM (CROWBERRY)—EPHEDRA (SHRUBBY HORSETAIL).

colour, arising out of the scales with which they are covered. A most ornamental shrub. The boughs are fringed first with innumerable tubular blossoms, and then with silvery-grey berries, which however fall before winter. It is doubtless tender in the north of England and in Scotland.

4. *Elæagnus REFLEXA*.—Japan, 1852. Shrub 12-15 feet. Leaves ovate-acuminate, pale-green above, silvery with scales beneath, so as to impart to them an almost metallic tinge. Flowers greenish-yellow, in axillary racemes. Young shoots at right angles with the stems, and in some cases reflected downwards. An elegant shrub, requiring a somewhat sheltered situation, which it fully deserves on account of its beautiful leaves and stems. It will only bear our winters in the southern and western districts of England and Ireland.

99. EMPETRUM—(*Crowberry*).

EMPETRACEÆ—DICECIA TRIANDRIA.

1. *Empetrum NIGRUM*.—England. Evergreen procumbent shrub. Leaves small, linear, resembling those of the heaths. Flowers small, purplish. Berries small, blackish, clustered. It is a small bush of slow growth, so hardy that it is found in North Lapland and Kamtchatka, where few other plants can grow. The berries are edible, and are much relished by grouse and other birds. It will not thrive unless in peat-soil.

100. EPHEDRA—(*Shrubby Horsetail*).

GNETACEÆ—DICECIA MONADELPHIA.

1. *Ephedra DISTACHYA*.—S. France, 1570. Shrub 4 feet, evergreen. Stems articulated, with two small linear leaves at each articulation, scarcely perceptible. Fruit ripening in

spring, of an agreeable acid flavour. The whole plant is curious and interesting, with a very distinct aspect. It looks far more like a rush than a woody shrub, and it is the stems which constitute it an evergreen, as the leaves are quite diminutive and fugacious, as well as being very few. Probably it would not prove hardy north of the Trent.

101. EPIGÆA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Epigæa* REPENS.—N. America, 1736. Evergreen creeping shrub. Leaves ovate, entire. Flowers white, cylindrical, in tufted racemes, very fragrant. Will only grow in peat, and even then but slowly. But the fragrancy and large size of its flowers, as compared with its closely trailing stems, redeem this plant from insignificance and recommend it to notice. It is rather impatient of removal.

102. ERICA—(Heath).

ERICACEÆ—OCTANDRIA MONOGYNIA.

1. *Erica* ARBOREA.—Pyrenees, 1658. Evergreen shrub, 12-15 feet. Leaves linear, 3-4 in a whorl. Flowers axillary; corolla bell-shaped, white; style prominent. This is one of the tallest growing of the heaths, and assumes a tree-like appearance. It requires some protection during very severe frost, and will only thrive in the southern parts of England or Ireland.

2. *Erica* AUSTRALIS.—Spain, 1769. Evergreen shrub 4-6 feet. Leaves 4 in a whorl, somewhat spreading, mucronate. Flowers terminal, small, of a purplish-red, abundantly produced and very ornamental. Only hardy in our southern counties.

3. *Erica* CARNEA (GYPSOCALLIS CARNEA).—North Wales.

Evergreen shrub 1 foot. Leaves 3-4 in a whorl, linear, acuminate. Flowers axillary, drooping, in unilateral racemes, of a conical shape. It flowers freely in the midst of frost and snow in January and February, and affords a delightful foretaste of coming spring.

4. *Erica* CILIARIS.—Cornwall. Evergreen shrub 1 foot. Leaves 3 in a whorl, ciliated. Flowers terminal, large, in sparse racemes, ventricose, of a pale red. A pretty heath, though not the prettiest.

5. *Erica* CODONODES.—South Europe (?). Evergreen shrub 10-12 feet. Leaves linear, 3-4 in a whorl. Flowers bell-shaped, white, abundantly produced in the axils of the leaves, all along the stems, at a time when hardly any shrub is in blossom—viz. from January to March, through frost and snow, when it forms a beautiful object. It is tolerably hardy, and of rapid growth for this tribe of plants.

6. *Erica* MULTIFLORA.—S. France, 1731. Evergreen shrub 1-2 feet. Leaves 4-5 in a whorl, linear. Flowers axillary in a racemose corymb, bell-shaped, with reflected limb, of a pale red. It flowers very freely, but requires a sheltered spot.

7. *Erica* STRICTA.—Italy, 1765. Evergreen shrub 6-8 feet. Leaves 4 in a whorl, obtuse. Flowers terminal, in clusters, of a purplish red. A pretty plant of upright growth. The variety *S. minima*, is a delicate dwarf plant, which grows in large and still increasing patches, and well deserves cultivation, if only for its dense foliage.

8. *Erica* TETRALIX.—England. Evergreen shrub 2 feet. Leaves 4 in a whorl, ciliated. Flowers in terminal heads. Common on our heaths, but sufficiently beautiful to adorn any garden. The variety *T. alba*, with white flowers, is also very pretty.

Erica VULGARIS (*see* CALLUNA).

103. ESCALLONIA.

ESCALLONIACEÆ—PENTANDRIA MONOGYNIA.

1. *Escallonia* ILLINITA.—S. America, 1830. Evergreen shrub 5-8 feet. Leaves ovate-cuneate, shining, with glandular spots beneath, somewhat viscous. Flowers in terminal racemes, pinkish-red, very abundant. Its copious red flowers almost obliterate the foliage in June, and render it then one of the greatest ornaments of our shrubberies. It flowers earlier than the *E. rubra*, and when the latter blossoms, the vigorous shoots of *E. illinita*, with their glandular hairs and beautiful glossy foliage, have substituted one attraction for the other. As far as present experience goes, this species is perfectly hardy in the climate of London.

2. *Escallonia* MACRANTHA.—Chili, 1847. Evergreen shrub 8-10 feet. Leaves broadly ovate, dark glossy green above, paler with resinous glands beneath, serrated. Flowers in terminal racemes, pinkish-red, freely produced. A beautiful shrub, whose bright shining leaves look quite gay and enlivening in winter. It bears any moderate degree of frost, but very severe weather sometimes kills the preceding year's shoots, when they have not had time to ripen their wood. A most desirable plant, and a great acquisition to our shrubberies. Trained to a wall, it soon veils the bricks from sight with its large, shining foliage, still more shining in winter than in summer.

3. *Escallonia* PTEROCLADON.—Patagonia, 1854. Evergreen shrub 6-8 feet. Leaves small, obovate, serrated. Flowers in numerous panicles, white, abundant, and highly ornamental. Beneath each tuft of leaves a thickening of the stem runs down, which gives it a winged appearance, whence the specific name "pterocladon" (winged branch). It forms a beautiful covering

to a low wall, as it produces dense shoots and blossoms profusely, whilst it readily admits of close training.

4. *Escallonia RUBRA*.—Chili, 1827. Evergreen shrub 6-8 feet. Leaves obovate, acuminate, serrated, with resinous dots beneath. Flowers red, tubular; petals reflexed at the apex. A very beautiful plant, but requiring a rather sheltered situation. Growth quick, foliage dense, flowers abundant.

N.B.—How far the foregoing species of *Escallonia* will prove hardy in the more northern zones of our island can only be ascertained by experiment. As is the case with many natives of high altitudes in low latitudes, the average temperature of a region is no indication of its fitness for the residence of such plants. Such average may result either from great extremes of cold and heat, or from mild winters and temperate summers,—two combinations under which different plants are differently influenced.

104. EUGENIA.

MYRTACEÆ—ICOSANDRIA MONOGYNIA.

1. *Eugenia UGNI*.—Chili, 1852. Evergreen shrub 4-5 feet. Leaves elliptic, smooth, leathery. Flowers pinkish-white, resembling those of a Myrtle. Berries eatable, aromatic. This pretty shrub is nearly hardy, but thrives best in a sheltered situation and peat-soil. When first introduced, it was hoped that the berries would have proved a valuable addition to our fruits, but the slow growth of the plant under our clouded skies, and its consequent infertility, have rendered the experiment unsuccessful. It will only thrive in the open air in a climate at least as genial as that of London.

105. EUONYMUS—(*Spindle Tree*).

CELASTRACEÆ—HEXANDRIA MONOGYNIA.

1. *Euonymus ALATUS*.—Japan, 1861. Shrub 4-6 feet. Leaves ovate, minutely serrated, of a lively light green. Flowers solitary, small, axillary, of a pale green. The stems and branches are so curiously and prominently winged with a corky substance as to give the plant a most distinctive and interesting character, especially when denuded of leaves; but it is at all times a desirable plant, and one well-deserving of general cultivation.

2. *Euonymus EUROPÆUS*.—England. Tree 25-30 feet. Leaves lanceolate-ovate, finely serrated, fetid when bruised. Flowers small, greenish-white. The fruit (a capsule of a bright rose-colour) and the seeds (of which the aril is of a fine orange) are beautiful and striking objects in autumn.

3. *Euonymus JAPONICUS* (fol. *VARIEGATIS*).—Japan, 1836. Evergreen shrub 8-10 feet. Leaves ovate, slightly serrated, of a pale green beneath; blotched very distinctly, and in a variety of forms, with either white (*f. argenteis*) or yellow (*f. aureis*). The golden-leaved variety is by far the finest, and fully deserves a place in every collection.

4. *Euonymus LATIFOLIUS*.—S. Germany, 1730. Tree 10-15 feet. Leaves large, broadly ovate, of a shining green. Flowers small, but the fruit is very ornamental in autumn from its brilliant scarlet hue, and the foliage is elegant.

5. *Euonymus RADICANS* (fol. *VARIEGATIS*).—Japan, 1864. Evergreen shrub 2-3 feet. Leaves ovate, slightly serrated, with brilliant white variegation, glaucous beneath. Flowers white, inconspicuous. This very hardy dwarf shrub seems admirably adapted for edgings. Strange how large a percentage of our blotch-leaved varieties emanate from Japanese gardens.

N.B.—The three Japanese species have not been known to us a sufficient length of time to justify us in fixing the limit of their hardiness. But judging from the little check they receive from our winters about London, it may fairly be hoped that they will prove tolerably hardy even in our northern districts.

106. EURYBIA.

COMPOSITÆ—SYNGENESIA SUPERFLUA.

1. *Eurybia* ILICIFOLIA.—N. Holland, 1848. Evergreen shrub 4-5 feet. Leaves ovate, with wavy spiny dentatures, stiff, shining above, downy beneath. Flowers axillary, rays white, disk yellow, fragrant. A pretty and curious shrub, not quite hardy, but which thrives well and flowers abundantly when grown against a wall. It has the stiff, spinous, glossy dark green leaves of the holly on a smaller scale, and flowers somewhat resembling those of a daisy. There is no chance of its proving hardy in the north.

107. EXOCHORDIA.

ROSACEÆ—ICOSANDRIA PENTAGYNIA.

1. *Exochordia* GRANDIFLORA.—China, 1854. Shrub 6-8 feet. Leaves lanceolate, entire, glabrous. Flowers in racemes, white, rather large, and very showy. This species is nearly allied to the Spiræas, none of which, however, can vie with it in the size of the flowers or its elegant habit of growth. It is quite hardy, and its merits entitle it to general notice.

108. FAGUS—(*Beech*).

CORYLACEÆ—MONŒCIA POLYANDRIA.

1. *Fagus* ANTARCTICA (or BETULOIDES).—Tierra del Fuego,

1830. Evergreen tree 40 feet. Leaves elliptic, crenulate, dark green, glossy, leathery. Flowers axillary. Nuts small. It forms vast forests in the inhospitable region of which it is a native. As might be expected from the tempestuous climate which it inhabits, the trunk grows to a large size as compared with the height of the tree, the branches are tortuous and knotty, and its growth is very slow. It is highly interesting, but not easy of cultivation.

2. *Fagus CUNNINGHAMI*.—Van Diemen's Land, 1840. Evergreen tree 40 feet. Leaves small, deltoid, serrate, leathery, glossy. It is a beautiful object from its dark, shining, dense foliage, but it is rather tender and requires very careful treatment. Indeed, it appears rather capricious in its requirements, as it will stand a low temperature one year and die off another without any apparent cause. It is not likely to stand the winter except in our southern counties.



FAGUS SYLVATICA—Burnham Beeches.

3. *Fagus FERRUGINEA*.—N. America, 1766. Tree 40-50 feet. Leaves ovate-acuminate, toothed, downy beneath, margins ciliated. It is very similar to the *F. sylvatica*, except that the leaf-buds are short and obtusely pointed, and the wood is red, whence its specific name.

4. *Fagus SYLVATICA*.—England. Tree 70-90 feet. Leaves ovate, toothed, shining, margins ciliated. Too well known to need description, but the following varieties well deserve attention :—

S. purpurea (or *atro-rubens*) the purple beech. The intensity of colour varies in different individuals, and the purple is sometimes modified into a copper tint, but all the shades of colours are beautiful.

S. heterophylla (or *Laciniata*, *asplenifolia*, or *incisa*). Different forms of the cut-leaved beech, named according to the shape of the leaf, but all being simply curious sports from the *F. sylvatica*.

S. pendula. The weeping variety, which forms a singular and beautiful object.

109. FICUS—(*Fig*).

URTICACEÆ—POLYGAMIA DICECIA.

1. *Ficus CARICA*.—Asia, date of introduction uncertain. Tree 20 feet. Leaves large and more or less deeply lobed. It ripens its well-known fruit when planted against walls, and even when grown as a standard in favourable situations in the southern counties of England. It thrives in any warm spot, and bears the smoke of crowded cities better than most trees. Its noble leaves, its longevity, its indifference to soil, provided it is tolerably sheltered, and the interesting historical associations connected with it, constitute its claim to

cultivation rather than its fruit, which, in England, only comes to maturity under peculiarly favourable conditions.

110. FONTANESIA.

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Fontanesia* PHILLYREOIDES.—Syria, 1787. Shrub (nearly evergreen) 12-15 feet. Leaves lanceolate, somewhat resembling those of the common privet. Flowers in small axillary racemes, yellowish, rather persistent. To train it into a handsome shape, it should be pruned to a single stem about 6 feet high, and then it will form a good head, with numerous, slender, pendulous branches. It is quite hardy in the south, but doubtfully so in the north of England.

111. FORSYTHIA.

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Forsythia* SUSPENSÆ.—Japan, 1850. Shrub with long trailing stems. Leaves light green, smooth, some of them lobed. Flowers axillary, of a bright yellow, with orange stripes. Its trailing habit and rapid growth fit it for rock-work, for training to walls, and other similar purposes. Its blossoms are larger than those of the *F. viridissima*, and its habit of growth more elegant.

2. *Forsythia* VIRIDISSIMA.—China, 1845. Shrub 8-10 feet. Leaves darkish green, ovate, the lower half entire, the upper half serrated. Flowers axillary, of a bright yellow, very numerous, and expanding in early spring. A compact bush, very desirable for its beautiful and early blossoms, only requiring to be better known to become a general favourite.

112. FOTHERGILLA.

HAMAMELIDACEÆ—ICOSANDRIA DIGYNIA.

1. *Fothergilla* ALNIFOLIA.—N. America, 1765. Shrub 6-8 feet. Leaves ovate, subcordate, toothed, of a light green colour. Flowers white, fragrant, numerous produced in early spring before the expansion of the leaves; an elegant and hardy little shrub which thrives best in peat. Its pretty and nicely scented flowers are amongst the earliest ornaments of the garden, and though individually small are so abundant as to make an agreeable show.

113. FRAXINUS—(Ash).

OLEACEÆ—POLYGAMIA DICEIA.

1. *Fraxinus* EXCELSIOR.—England. Tree 60-80 feet. Leaves pinnate, leaflets 7-13, lanceolate, acuminate, serrated, smooth. Flowers in loose axillary spikes, expanding before the leaves. Leaf-buds large, black. One of our noblest forest-trees, of which there are many varieties. The most ornamental and interesting of these are the following:—

E. pendula, the weeping ash, a well-known and beautiful tree, sweeping to the ground.

E. aurea, with yellow bark and contorted branches, and leaves of a yellowish green.

E. crispa, with curled dark leaves, and of stunted growth, more interesting than elegant.

E. nana, the dwarf ash, seldom exceeding 4-6 feet in height.

2. *Fraxinus* JUGLANDIFOLIA.—N. America, 1724. Tree 30-50 feet. Leaves pinnate, leaflets 5-9, large, elliptic-lanceolate, serrated, somewhat paler beneath, more persistent than in

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other species. Flowers in pendulous bunches. A very handsome species, of which there exists a splendid specimen at Twickenham, 70 feet high, which is said to retain its leaves till near Christmas.

3. *Fraxinus* XANTHOXYLOIDES.—North India, 1845. Shrub 6-8 feet. Leaves small, ovate, deeply cut, segments acute. One of those curious sports in which Nature sometimes indulges, a dwarf member of a family of giants. It is a small shrub, of compact habit and with prettily-cut leaves, but which assuredly no one would recognise as an ash, and which it requires great faith in the accuracy of botanical diagnosis to acknowledge as one. It appears to be quite hardy.

114. GARRYA.

GARRYACEÆ—DICECIA TETRANDRIA.

1. *Garrya* ELLIPTICA.—N. Carolina, 1828. Evergreen shrub 8-10 feet. Leaves oblong-acute, dark glossy green above, hoary beneath, leathery. Flowers in slender, pendulous, catkin-like racemes, sometimes 10-12 inches long, which, at any season, would present a most graceful and elegant appearance, but being produced in mid-winter (December and January), in the midst of frost and snow, are welcomed with delight. To thrive and blossom freely, this charming plant should be grown against a wall, to which it can be as easily trained as a peach-tree. It is doubtful whether it could bear the climate of the north of England.

2. *Garrya* MACROPHYLLA.—Mexico, 1846. Evergreen shrub 6-8 feet. Leaves large, ovate, dark green above, white and downy beneath. Of the catkins and fruit little is at present known. It is thought to be tolerably hardy, and it is here inserted in the hope that it may prove so, and because in that case

its beautiful foliage will entitle it to extensive cultivation. It is, however, only in sheltered spots in the southern and western counties that it can be expected to thrive in the open air.

115. GAULTHERIA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Gaultheria PROCUMBENS*.—N. America, 1762. Evergreen, procumbent shrub. Leaves obovate, toothed, somewhat ciliated. Flowers white, terminal, not numerous, succeeded by fine red berries, which last through winter and are eatable. The leaves can be used as a substitute for tea, and are said to make an agreeable beverage.

2. *Gaultheria SHALLON*.—N. America, 1826. Evergreen shrub 2-3 feet. Leaves broadly ovate, serrated, of a light green colour. Flowers in unilateral racemes, white, urn-shaped. Berries purple, fleshy, of an agreeable flavour in tarts. Stems hairy. Thrives under the drip of trees, and even in pine-forests where hardly anything else will grow. It is used for covers, the berries being a favourite food for game.

116. GENISTA.

LEGUMINOSÆ—MONADELPHIA DECANDRIA.

1. *Genista RADIATA*.—Italy, 1758. A close-branched shrub 4 feet. Leaves trifoliate, small. Flowers in heads of 2-4. The densely-grouped branchlets give this shrub a curious and interesting aspect, in addition to its beauty when in flower.

2. *Genista SAGITTALIS*.—Alps, 1750. A prostrate-growing

shrub, chiefly remarkable for its winged, two-edged, articulate stems and branches, which give it quite a distinct character. Leaves small, ovate-lanceolate. Flowers terminal, yellow, in small bunches, very numerous and ornamental.

3. *Genista* TRIQUETRA.—Spain, 1748. Shrub of trailing habit. Leaves mostly trifoliate, deciduous. Stems triangular. Flowers yellow, numerous, in short terminal racemes. Well fitted for rock-work, or for training to a low wall. This plant is deserving of a place in every garden. When in blossom, it is one mass of yellow, and afterwards, from its interlaced ramification, it has the appearance of an evergreen. It assumes a somewhat globular shape, and grows 2-3 feet in height.

117. GLEDITSCHIA.

LEGUMINOSÆ—POLYGAMIA DICECIA.

1. *Gleditschia* FEROX.—Native country and date of introduction unknown, but supposed to be a variety of *G. sinensis*; the spines, however, are stronger, more branchy, and more numerous. The foliage, which is pinnate, resembles it greatly in lightness and elegance, and in all the species it is exceedingly graceful and attractive. All the *Gleditschias* are very impatient of transplantation, and for two or three years after planting scarcely make any growth, but once settled they are very hardy, and become beautiful and shapely trees, with foliage peculiarly light and graceful.

2. *Gleditschia* SINENSIS.—China, 1774. Tree 50-60 feet. Leaves bipinnate; leaflets ovate, obtuse, larger than those of any other species. Spines stout; those on the stem in groups or bundles. Pods not so long as those of the *G.*

triacanthos. There is a variety (*S. inermis*) without spines, and of a smaller habit of growth.



GLEDITSCHIA TRIACANTHOS.

3. *Gleditschia* TRIACANTHOS.—Virginia, 1700. Tree 70-80 feet. Leaves pinnate ; leaflets linear-oblong, of a fine light-green colour. The branches are clothed with strong trifid spines, which remain on the trunk for several years, and give the tree a formidable appearance. Flowers small and inconspicuous, followed by long pods. In America it is called the honey-locust.

118. GLYPTOSTROBUS—(*Water Pine*).

CONIFERÆ—MONCECIA MONADELPHIA.

1. *Glyptostrobus* HETEROPHYLLUS.—China, 1842. Tree

12-15 feet. Leaves at first scale-formed, closely adpressed ; afterwards longer, awl-shaped, decurrent. Cones terminal, oblong, scaly. The growth is very slow ; but it is tolerably hardy, and the diversity in the leaves makes it an interesting plant. It bears some resemblance to, and is sometimes mistaken for, the *Taxodium Sinense*, with which, however, it cannot vie in elegance of habit.

119. GORDONIA.

TERNSTRÖMIACEÆ—MONADELPHIA POLYANDRIA.

1. *Gordonia PUBESCENS*.—Georgia, 1774. Tree growing to 30 feet high in its native country, but not exceeding 10-12 feet in England. Leaves obovate, serrated, glossy above, pubescent beneath. Flowers white, large, fragrant, expanding late in autumn. It is a beautiful plant, but requires wet peat-soil and a sheltered situation. It is somewhat hardier than the *G. lasianthus*, and is therefore preferable to it, although of smaller dimensions. Neither will flourish out of doors except in the southern counties, and then only under favourable conditions.

120. GRABOWSKIA.

SOLANACEÆ—PENTANDRIA MONOGYNIA.

1. *Grabowskia BÖRHAVLÆFOLIA*.—Brazil and Peru, 1780. Shrub 6-7 feet. Leaves small, elliptic, entire, of a glaucous green both above and beneath. Flowers white, with greenish streaks, in small bunches, succeeded, in favourable seasons, by fruit shaped something like the coffee-berry. It is wonderfully hardy, considering that its principal habitat is the south of Brazil. It is interesting in a collection, but otherwise

presents but few attractive features, and it can only be expected to thrive in the south and west of England and Ireland.

121. GRISELINIA.

CORNACEÆ—TETRANDRIA MONOGYNIA.

1. *Griselinia* LITTORALIS.—New Zealand, 1850. Evergreen shrub 6-8 feet. Leaves ovate, entire, of a pale green, very smooth, and rather succulent. Flowers small, greenish—rarely produced in this country hitherto. A very beautiful evergreen, remarkable for its light green foliage and its graceful habit. It is unfortunately a little tender, and suffers injury from severe frosts or cold easterly winds. A very slight protection will guard against this; but it is useless to plant it out of doors in latitudes much higher than that of London.

2. *Griselinia* MACROPHYLLA.—New Zealand, 1854. Evergreen shrub 10-12 feet. Leaves very large and fleshy, nearly round, obliquely cordate at the base, of a pale green, very smooth and shining. Flowers (?). The hardiness of this magnificent shrub has not yet been sufficiently tested; but should it prove patient of our climate (even were it to require some protection), it will be a great acquisition, as no evergreen surpasses it in beauty of foliage, and few equal it.

122. GYMNOCLADUS—(*Stump Tree*).

LEGUMINOSÆ—DICECIA DECANDRIA.

1. *Gymnocladus* CANADENSIS (also called Kentucky Coffee Tree).—Canada, 1748. Tree 30-40 feet. Leaves bipinnate, very large and elegant; the petioles with a violet tinge. Flowers white, in spikes about 2 inches long. In winter the tree pre-

sents a singular appearance—that of being dead, as the branches are few, thick, and without any appearance of buds, whence the Canadians call it the Stump-tree. The size and elegance of the leaves give it, however, a splendid aspect in summer.

123. HALESIA—(*Snowdrop Tree*).

STYRACEÆ—DODECANDRIA MONOGYNIA.

1. *Halesia* DIPTERA.—Georgia, 1758. Tree 10-20 feet. Leaves ovate, acuminate, serrated, similar to but much larger than those of the *H. tetraptera*. Flowers also similar, but rather smaller. Of the two, the *H. tetraptera* is the preferable species, but both are noticeable for their shapely growth as well as for their beautiful flowers.

2. *Halesia* TETRAPTERA.—Carolina, 1756. Tree 20-30 feet. Leaves ovate, acuminate, serrated. Flowers in drooping fascicles, pure white, resembling those of the snowdrop, and freely produced. The foliage is abundant and the growth tolerably rapid. A very ornamental tree, and perfectly hardy.

124. HALIMODENDRON—(*Salt Tree*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Halimodendron* ARGENTEUM.—Siberia, 1779. Shrub 4-5 feet. Leaves silky, with a white down. Flowers numerous, purplish. One of those peculiar shrubs which grow in the saline steppes of Siberia, and which bear a general resemblance to each other, particularly in the silvery silky appearance of their leaves. It will thrive the better if a little salt

is, once or twice a-year, mixed with the soil around it. The white powdery foliage forms a good contrast with the vivid green of other shrubs.

125. HAMAMELIS—(*Wych Hazel*).

HAMAMELIDACEÆ—TETRANDRIA DIGYNIA.

1. *Hamamelis VIRGINICA*.—N. America, 1736. Shrub 20 feet. Leaves ovate, toothed, of a pale green hue. Flowers yellow, small, but numerous, and produced so late in autumn as to last partly through winter. This peculiarity, shared by so few out-of-door plants, renders it a desirable acquisition to the shrubbery. It is of slow growth, but perfectly hardy.



HEDERA HELIX—Ivy.—Horton Church : Gray's "Ivy-mantled Tower."

126. HEDERA—(*Ivy*).

ARALIACEÆ—DECANDRIA DECAGYNIA.

1. *Hedera* HELIX.—England. A well-known climbing evergreen shrub. Leaves very variable, according to soil, luxuriance of growth, nature of the support to which they are attached, etc., but commonly coriaceous, shining, chiefly with five lobes more or less angular, sometimes entire. Flowers in umbels, greenish, succeeded by dark purple berries. The stems throw out adhesive roots, by which they become firmly attached to the tree or wall, etc., on which they climb. There are numerous varieties, amongst which the following are the most beautiful :—

H. fol. aureo-variegatis.

H. fol. maculatis.

But several others are also worthy of cultivation, some distinguished by the colour or variegation of their foliage, and others by the size or anomalous shape of their leaves. All are beautiful, whether clothing the naked stems of tall trees,—mantling with luxuriant evergreen foliage the suggestive ruins of the past, or the hideous bricks and mortar of the present,—or creeping along the ground, and covering hedge-banks, old stone-quarries, and the sunless bottoms of woody ravines.

2. *Hedera* REGNIERIANA.—Nepal, 1850. Evergreen climbing shrub. Leaves very large, heart-shaped, nearly entire, of a dark green colour. Flowers in umbels, greenish, rarely produced in this country. Its large foliage and rapid growth entitle it to distinction. It appears to be quite hardy.

127. HELIANTHEMUM (*Sun Rose*).

CISTACEÆ—POLYANDRIA MONOGYNIA.

1. *Helianthemum* CANESCENS.—S. Europe, 1820. Evergreen shrub 1 foot. Leaves glaucous green above, hoary beneath, oblong, upper ones lanceolate-acute. Flowers reddish crimson, large, showy. A very elegant little shrub.

2. *Helianthemum* CROCEUM.—Spain, 1800. Evergreen shrub, nearly procumbent. Lower leaves roundish, those near the tops of the stems more lanceolate and acute, glaucous above, white and hoary beneath, margins revolute. Flowers yellow, abundant. This (as well as most of the other species) is well adapted for rock-work.

3. *Helianthemum* GRANDIFLORUM.—Pyrenees, 1800. Evergreen shrub about 1 foot high. Leaves oblong, green above, hairy and paler beneath. Flowers yellow, larger than the average of species. A hardy and desirable species.

4. *Helianthemum* HYSSOPIFOLIUM.—Italy, 1825. Evergreen shrub about 1 foot high. Leaves oval, except those situated higher up on the stems, which are lanceolate, tomentose. Flowers copper-coloured, abundantly produced. Very hardy and of luxuriant growth.

5. *Helianthemum* SULPHUREUM.—Spain, 1795. Evergreen shrub, nearly procumbent. Leaves green above, paler beneath, lanceolate. Flowers pale yellow, less abundant than in most other species. A fine shrub, but it is not quite hardy.

The above five species are selected from a very large number introduced into England at various times, but of which some are too tender for outdoor cultivation ; some have

died out and have not been replaced ; some are mere hybrids ; some are hardly worth cultivation ; and many are so nearly allied to others in specific characters, as well as in outward appearance, that they are not entitled to a separate specific name. Loudon, in his *Arboretum Britannicum*, has enumerated and described ninety-nine species, and he is entitled to all praise for his conscientious performance of the duty that devolved on him of registering every species, real or apparent, beautiful or ugly ; but the labour of the amateur desirous of making a selection from Loudon's list by study and comparison, could only be second, *parvo intervallo*, to his own in marshalling the formidable array.

The species enumerated in this article are tolerably hardy in climates similar to those of London ; but they would probably not outlive the colder temperature of the higher latitudes of our island.

128. HIBISCUS—(*Althæa Frutex*).

MALVACEÆ—MONADELPHIA POLYANDRIA.

1. *Hibiscus* SYRIACUS.—Syria, 1596. Shrub 8 feet. Leaves ovate, three-lobed, wedge-shaped. Flowers axillary, large, bell-shaped. Of this well-known flowering shrub there are a number of garden varieties, of different colours, both single and double. It bears its blossoms late in autumn, and when well-grown, is very showy, but it does not thrive in all situations, and requires a sunny exposure and good soil. It is pretty hardy in our London climate, but would require protection in the northern parts of our island.

129. HIPPOPHAE—(*Sea Buckthorn*).

ELÆAGNACEÆ—DICECIA TETRANDRIA.

1. *Hippophae* RHAMNOIDES.—England, on the sea-coasts. Tree 20-30 feet. Leaves linear-lanceolate, upper side dark green, silvery beneath. The berries produced on the female plant are of a bright orange. When trained to a single stem, it forms a handsome tree, of a distinctive appearance, by reason of the peculiar shape and colour of its leaves. Its flowers are diminutive, but very numerous, and are produced in early spring.

130. HYDRANGEA.

SAXIFRAGACEÆ—DECANDRIA DI-TRIGYNIA.

1. *Hydrangea* ARBORESCENS.—N. America, 1736. Shrub 4-6 feet. Leaves ovate, large, toothed, somewhat hoary beneath. Flowers white, in corymbs, some of them sterile, with a fragrant smell.

2. *Hydrangea* HORTENSIA (the Common Hydrangea).—Japan, 1790. Shrub 4-6 feet. Leaves large, ovate, acuminate, toothed. Flowers in large corymbs, white or (more or less) pink. A well-known favourite, but not quite hardy. However, when it is killed to the ground by our frosts, it invariably springs up again luxuriantly the following year. This recuperative power is, however, impaired in the more northerly districts, unless protection by litter or ashes over the crown of the plant be afforded. In some soils the pink tinge in the flowers is very deep and verges on blue.

3. *Hydrangea* NIVEA.—Carolina, 1806.—Shrub 4-6 feet. Leaves broadly ovate, acuminate, coarsely toothed, with a

white pubescence beneath. Flowers in corymbs, white, some sterile with enlarged sepals. The silvery-backed leaves are very handsome.

4. *Hydrangea* QUERCIFOLIA.—Florida, 1803. Shrub 6-8 feet. Leaves large, ovate, obscurely and irregularly lobed, hairy beneath. Flowers in large paniced corymbs, mostly sterile, with enlarged sepals, white. An interesting species with leaves and flowers on a large scale, only hardy in the warmer parts of England.

131. HYPERICUM—(*St. John's Wort*).

HYPERICACEÆ—POLYADELPHIA POLYANDRIA.

1. *Hypericum* CALYCINUM.—Ireland. Evergreen shrub, never exceeding 2 feet in height. Leaves broadly ovate, rather leathery, studded with pellucid dots. Flowers solitary, yellow, very large and showy. Its creeping roots throw up numerous stems all round, so that a single plant quickly covers a large space of ground. Both leaves and flowers are beautiful, and it is a most useful plant to cover rock-work, banks, or the surface of old shrubberies, etc.

2. *Hypericum* HIRCINUM.—S. Europe, 1640. Shrub 3-4 feet. Leaves ovate-lanceolate, sessile. Flowers yellow, abundantly produced from July to September. It is of easy culture, will grow almost anywhere, and is very useful to fill up odd corners.

3. *Hypericum* NEPALENSE.—Nepal, 1855. Shrub 3-4 feet. Leaves ovate, green, with a tinge of red above, pale green beneath, densely clothing the branches and shoots. Flowers pale yellow, solitary, of a waxy consistency, and very elegant. Both leaves and flowers are ornamental, and give this shrub a decided pre-eminence over its numerous congeners, many of which, however showy, are rather *weedy* in habit and

inflorescence. The present species is quite hardy in the climate of London, but might not prove so in the more northerly parts of the kingdom.

132. IBERIS—(*Candytuft*).

CRUCIFERÆ—TETRADYNAMIA.

1. *Iberis* SEMPERVIRENS.—Candia, 1731. Evergreen shrub 1-2 feet. Leaves linear-clavate, of a dark green, smooth. Flowers white, so numerously produced early in spring as to give the plant the appearance of snow newly fallen. It is very hardy, and well suited for small gardens or rock-work.

133. ILEX—(*Holly*).

AQUIFOLIACEÆ—TETRANDRIA MONOGYNIA.

1. *Ilex* AQUIFOLIUM.—Britain. Evergreen tree 30-40 feet. Leaves dark green, coriaceous, shining, spiny-toothed, waved. Flowers axillary, whitish, in irregular umbels, very abundant in some years and much less so in others. Berries red, persistent during winter. In large or full-grown trees, the leaves at and near the top are, for the most part, nearly entire and not spiny. This old favourite needs no eulogy (whilst deserving much), as its merits are universally recognised. It may be observed, however, that for hedges no other plant is so well adapted. It bears the shears well, and forms a fence as tall, as wide, and as dense, as can be wished for by the most exacting. It is of rather slow growth for the first year or two, but after that, if a moderate degree of attention be bestowed upon it, it advances more rapidly, and soon realises its character for combined beauty and utility.

Few trees are so prolific of ornamental and interesting varieties. Of these some exhibit modifications in the shape

and others in the colours of the leaves. In the former category the most striking are—

- (1.) *A. recurvum*; leaves curled back.
- (2.) *A. crassifolium*; leaves very thick.
- (3.) *A. ferox*; surface of leaves spiny as well as the margins, commonly called the Hedgehog variety.

The varieties arising out of the colour of the leaves are very numerous, some with yellow and some with white blotches, in a great diversity of proportions, but nearly all of them highly ornamental, and daily becoming more popular and more sought after.

2. *Ilex* CORNUTA.—China, 1848. Evergreen tree 15-20 feet. Leaves nearly quadrangular, each corner armed with a stout sharp spine, besides a terminal one at the apex of the mid-rib; very stiff and coriaceous, dark green above, paler beneath. Flowers greenish, in small axillary bunches. A fine plant, and the leading type of several other species resembling it in its peculiarities of foliage, such as the *I. Fortunei*, *furcata*, etc. So far it has proved quite hardy in the climate of London.

3. *Ilex* LATIFOLIA.—Japan, 1840. Evergreen tree 20-30 feet. Leaves very large (sometimes 10-12 inches long), ovate, spineless, somewhat resembling those of the common laurel, but darker in colour. Flowers axillary, whitish. A very handsome and distinct species, requiring shelter from strong winds, which injure and dwarf its noble foliage. It may probably prove rather tender in the northern counties.

4. *Ilex* OPACA.—N. America, 1744. Evergreen tree 20-50 feet, according to soil and climate. Leaves ovate, coriaceous, scolloped with spiny teeth, smooth, but not shining. Flowers whitish, in small racemes, on the old wood. A very fine tree, which, to our American brethren, fulfils the same offices as our native holly to us. It is said that specimens are occa-

sionally found which reach the height of 80 feet, and if so, magnificent indeed must be their aspect.

134. ILLICIUM—(*Aniseed Tree*).

MAGNOLIACEÆ—POLYANDRIA POLYGAMIA.

1. *Illicium* FLORIDANUM.—Florida, 1766. Evergreen shrub 6-8 feet. Leaves lanceolate, coriaceous, entire, persistent. Flowers red, odorous, polypetalous, scented. This fine shrub exhales an aniseed odour from all its parts, and the flowers are very handsome, but it requires some protection from cold easterly winds.

2. *Illicium* RELIGIOSUM.—Japan, 1842. Evergreen shrub 4-5 feet. Leaves ovate-lanceolate, rather fleshy and thick, of a light green. Flowers very pale yellow, many-petaled, fragrant. Every part of the shrub (wood, bark, leaves, and flowers) is scented, the odour approaching to that of aniseed. It is a charming plant, but rather tender, and requires both a peat-soil and a sheltered situation. When it thrives, the trouble of culture is fully repaid.

It is doubtful if either of the species would withstand the winters in a higher latitude than that of London, unless it be in the western parts of Ireland.

135. INDIGOFERA—(*Indigo*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Indigofera* DECORA.—Shanghae, 1844. Shrub 2 feet. Leaves pinnate, pubescent. Flowers in long racemes, abundantly produced, of a pale rose colour mottled with purple. A charming little shrub, which frequently dies down in winter, but, if protected by a little litter, shoots up again vigorously, and generally flowers in profusion. It will,

however, only resist such frosts as are usual in our southern counties ; farther north, no doubt, it would succumb.

136. ITEA.

ESCALLONIACEÆ—PENTANDRIA MONOGYNIA.

1. *Itea VIRGINICA*.—N. America, 1744. Shrub 6-8 feet. Leaves lanceolate, toothed. Flowers in terminal racemes, white. A pretty shrub, but to thrive and flower well, it requires a peaty or sandy soil with plenty of moisture. It continues in flower for two or three months, and is tolerably patient of our winter frosts.

137. JASMINUM.—(*Jasmine*).

JASMINACEÆ—DIANDRIA MONOGYNIA.

1. *Jasminum FRUTICANS*.—Levant, 1570. Shrub 8-10 feet. Leaves alternate, trifoliate (a few simple), obovate, nearly evergreen. Flowers yellow. Berries freely produced, black. It sends up many suckers, which give it a somewhat irregular appearance.

2. *Jasminum NUDIFLORUM*.—China, 1844. Shrub 6-10 feet. Leaves ternate, leaflets oval, nearly evergreen. Flowers yellow, expanding in winter, sometimes before Christmas, sometimes only in February. This circumstance entitles it to admittance in every collection. It succeeds best when trained to a wall, where frequently its bright yellow corolla contrasts curiously with the snow which rests upon it. It appears to be very hardy, and will probably thrive in any part of England.

3. *Jasminum OFFICINALE*.—Asia, before 1600. Climbing shrub. Leaves opposite, pinnate, leaflets 5-9, ovate, acuminate. Flowers white, very sweet scented. The young shoots, which are numerous, are of a fine deep green. This is the well-

known and much-admired Common or Cape Jasmine. It endures the smoke and confinement of cities as hardily as the Ivy or Aucuba, but in such situations does not blossom so freely as in purer air.

4. *Jasminum REVOLUTUM*.—Nepal, 1812. Shrub 10-12 feet. Leaves alternate, pinnate; leaflets 5-7, elliptic, smooth. Flowers in terminal corymbs, bright yellow, very fragrant. It is tolerably hardy, but grows best as a wall-shrub. There is a variety of this, called the *J. pubigerum*, which is hardier than the species, but the leaves and the flowers are smaller. Both are nearly evergreen. It is doubtful whether either would stand a climate more northerly than that of London.

138. JUGLANS—(*Walnut*).

JUGLANDACEÆ—MONŒCIA POLYANDRIA.

1. *Juglans CINEREA* (Butternut).—N. America, 1699. Tree 60-70 feet. Leaves pinnate, leaflets 15-17. Fruit on a pliant peduncle, of oblong oval form, containing the oblong acuminate nut. The kernel is oily, whence the name butter (or oil) nut. It differs from the *J. nigra* chiefly in the shape of the fruit.

2. *Juglans NIGRA*.—N. America, 1656. Tree 80-90 feet. Leaves pinnate, leaflets 13-17. Fruit globose, roughish, but the nuts are not of agreeable flavour. The wood is dark, indeed nearly black, whence its specific name. Some noble specimens of this fine tree exist in this country, which fully justify the wish that they were more numerous.

3. *Juglans REGIA* (the Common Walnut).—Persia, about 1650. Tree 70-80 feet. Leaves pinnate, leaflets 5-9, aromatic when bruised. Fruit green, oval, enclosing the edible nut. It sends down a long and vigorous taproot, which makes its transplantation difficult unless proper precautions be taken. In favourable soil, when once established, it forms a lofty and

well-proportioned tree, valuable for its fruit and timber as well as for its beauty.

The *J. regia laciniata* is a variety with curiously cut leaves, which give it a very distinct and elegant aspect, and when well grown, it is one of the handsomest of all lacinated varieties. The shoots have a purple tinge, and altogether it deviates so widely in appearance from the parent stock as to be absolutely unrecognisable.

139. JUNIPERUS—(*Juniper*).

CONIFERÆ—DICECIA MONADELPHIA.

1. *Juniperus CHINENSIS* MAS.—China, 1814. Tree 15-20 feet. Leaves in threes, sharp-pointed, decurrent, but partly spreading, densely clustered on smaller stem-shoots. Branches thickly placed on the stem, mostly pointing outwards, abundantly covered with stamiferous flowers of a bright yellow colour. An elegant pyramidal tree, densely clothed with bright green foliage. The female is a less tall and less handsome plant.

2. *Juniperus COMMUNIS*.—England. Tree 12-18 feet. Leaves awl-shaped, acuminate, $\frac{1}{2}$ -inch long, in whorls of threes, green above, grey beneath. Berries axillary, dark purple when ripe, covered with a bloom, juiceless, small. It is of slow growth, and is seldom found otherwise than as a mere shrub of a few feet in height, but if carefully pruned and attended to, it may be trained into a fine bush.

3. *Juniperus EXCELSA*.—Siberia, 1806. Tree 30-40 feet. Leaves in twos, small, glaucous, loosely imbricated, spreading at the points. Berries glaucous, purple, $\frac{1}{2}$ -inch in diameter. Branches numerous, dense, somewhat fastigate. A fine tree, of more rapid growth, and attaining nobler dimensions, than most of its congeners.

4. *Juniperus HIBERNICA*.—Ireland, and on the Pyrenees.

Tree 12-15 feet. It is generally considered a variety of the *J. communis*, from which, however, it differs greatly by its fastigate or columnar habit of growth. The branches are short and slender, and so densely clothed with foliage as to give the tree the appearance of a pillar of green. As an isolated object on a small lawn, nothing can be more eligible.

5. *Juniperus* OBLONGA (*v. pendula*).—Japan, 1840. Tree 15-20 feet. Leaves in whorls of three, stiff, $\frac{1}{2}$ -inch long, concave, sharp-pointed. Berries solitary, of a glaucous violet colour. Branchlets slender, flexible and drooping. A very elegant pendulous tree.

6. *Juniperus* PHŒNICEA.—S. Europe, 1683. Shrub 12-15 feet. Leaves in threes, imbricated, smooth, bright green, a few occasionally found open and spreading. Branches numerous, pyramidally disposed. Berries terminal, pale yellow, about the size of a pea.

7. *Juniperus* PROSTRATA.—N. America, 1780. Shrub 1 foot. Leaves in twos, dense, concave, acute. Stems long, prostrate, trailing, and spreading over a large space. It is well adapted for rock-work, over which it widely spreads its dense glaucous foliage.

8. *Juniperus* RECURVA.—Nepal, 1832. Shrub 6-8 feet. Leaves linear-lanceolate, pointed, loosely imbricated, the old brown ones contrasting with those of the season, which are of a light green. Branches recurved and pendulous, but scanty and rather bare, giving the plant a singular and distinct aspect. If it could be trained into a close compact shrub, nothing could exceed its elegance.

9. *Juniperus* SABINA (the Savin).—Alps, 1548. Shrub 6-10 feet. Leaves in twos, opposite, imbricated, convex on the back, of a disagreeable smell. Berries almost black, of the size of a currant, monospermous.

10. *Juniperus* SABINOIDES.—Spain, 1562. Shrub 2-3 feet. Leaves in twos, opposite, very short, with a sharp point, of a glaucous blue colour. Stems and branches spreading out horizontally, very dense and stiff. It forms an elegant dwarf bush for banks and rock-work.

11. *Juniperus* VIRGINIANA.—N. America, 1664. Tree 40-50 feet (commonly called the Red Cedar). Leaves in twos and threes, the young ones imbricated, the old ones spreading. Branches spreading horizontally and feathering to the ground. Berry small, dark blue. The wood is used in the manufacture of black-lead pencils. It is a fine tree, but does not attain its full growth in this country.

140. KALMIA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Kalmia* ANGUSTIFOLIA.—N. America, 1736. Evergreen shrub 2-3 feet. Leaves oblong, rather rusty beneath. Flowers in lateral corymbs, dark red. It will only thrive in peat-soil. The abundance of its peculiarly-shaped and peculiarly-coloured blossoms, entitle it to more attention than it at present receives. There are several varieties of it, of which the finest, both in foliage and blossom, is the *A. myrtifolia*.

2. *Kalmia* LATIFOLIA.—N. America, 1734. Evergreen shrub 8-10 feet. Leaves oval, coriaceous, smooth. Flowers in terminal corymbs, white or very pale pink, spotted, of a curious parasol-like shape. An elegant shrub, which requires a peat-soil. Both its leaves and its flowers are highly ornamental, and it is a general favourite in all gardens where it can be properly grown. It is very tolerant of cold, but fastidious in regard to soil.

141. KERRIA.

ROSACEÆ—ICOSANDRIA POLYGYNIA.

1. *Kerria* JAPONICA.—Japan, 1700. Shrub 8-10 feet. Leaves ovate-lanceolate, unequally toothed, veined. Flowers yellow. Bark of a bright green. It is the double-flowering variety which is generally cultivated here, and it is at the same time the most common and the most ornamental. It flowers early, and is very showy and quite hardy. No flowering shrub is more frequently seen in cottage-gardens, where it seems to have become a special favourite.

A fine blotched-leaved variety was introduced from Japan in 1865, with leaves deeply and unequally serrated, much narrower than in the species, but long and acuminate, and largely tinted with a silvery-white variegation. It may be doubted whether this be not a distinct species, as its habit is quite dwarf, and it has a gracefully delicate aspect, whereas the type is large-growing and almost coarsely vigorous.

142. KÖLREUTERIA.

SAPINDACEÆ—OCTANDRIA MONOGYNIA.

1. *Kölreuteria* PANICULATA.—China, 1763. Tree 30-40 feet. Leaves pinnate, changing in autumn to a yellow colour. Flowers yellow, in loose terminal spikes, which are succeeded by large bladdery capsules. It is in every way well worthy of cultivation, both for its fine foliage and its flowers. It does not grow very rapidly, but the old trees form handsomely-shaped heads. It is strange how very seldom this handsome tree is met with, considering that it has been introduced for more than a century. Has its uncouth name something to do with this neglect?

143. LARDIZABALA.

LARDIZABALACEÆ—DICECIA HEXANDRIA.

1. *Lardizabala BITERNATA*.—Chili, 1842. Evergreen climbing shrub. Leaves ternate, leaflets large, dark green above, lighter beneath, beautifully bright and glossy, some of the folioles partially lobed. Flowers dark purple tinted with brown, in pendulous racemes, expanding in winter, and hence the more acceptable. It is a most beautiful climber, interesting in all its parts, and well worth the privilege of a wall on which to train it. It may probably be too delicate to stand the rough keen breezes of our northern counties, but this is merely conjecture, and the experiment ought to be carefully made.

144. LARIX—(*Larch*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Larix AMERICANA* (or *MICROCARPA*).—N. America, 1739. Tree 60-80 feet. Differing from the *L. Europœa* chiefly in the leaves being shorter and the cones much smaller. The variety *A. pendula* is worthy of cultivation from the drooping habit of its branches, which, however, are few and impart a rather straggling appearance to the head of the tree.

2. *Larix EUROPEÆA* (the Common Larch).—Alps, 1629. Tree 80-100 feet. Leaves deciduous, linear, in bundles round a central bud, single elsewhere, of a beautiful bright green. Cones erect, 1 inch long. Branches spreading, branchlets pendulous. This lovely tree, equally admired for its beauty and its usefulness, is of very rapid growth, and will adapt itself to most soils and situations. Its quickly elaborated timber is highly esteemed and very valuable. It has been planted more extensively than any other tree of foreign introduction, especially in Scotland, where there are large forests, of which the produce has proved highly remunerative to the owners.

145. LAURUS—(*Laurel*).

LAURACEÆ—ENNEANDRIA MONOGYNIA.

1. *Laurus* BENZOIN.—Virginia, 1688. Shrub 12-15 feet. Leaves obovate, entire, paler and rather downy beneath, acute. Flowers small, greenish, in umbels. The bark is highly aromatic, which circumstance, combined with the elegance of its foliage, entitles this shrub to general notice. It is not from this plant that the true gum benzoin is (as was once thought) procured, but from a species of *Styrax*. It thrives best when grown in peat-soil, and might probably prove hardy even in the north.

2. *Laurus* NOBILIS (Bay Tree).—Italy, 1560. Evergreen tree 30-40 feet. Leaves elliptic-lanceolate, dark green, of a leathery texture, aromatic when bruised. Flowers small, greenish, in short racemes, the male and female on different trees, this species being dioecious. A beautiful evergreen, furnishing the wreaths with which successful generals in ancient Rome, and successful poets in mediæval Italy, were crowned. It is a very old favourite in English gardens, and although the height to which it reaches entitles it to be called a tree, yet it never loses its shrubby form unless artificially trained to a single stem. It is liable to injury from severe frosts, sometimes only to the extent of browning the leaves or killing the tips of young shoots, but occasionally disfiguring the tree by the destruction of leaves and branches, and leaving only the trunk unscathed. But as it is very tenacious of life, fresh shoots and branches are quickly made, and in a year or two scarcely a trace remains of the previous ravages. It grows in Scotland, but is of course more liable there to the injuries just described than in the southern parts of England.

3. *Laurus* SASSAFRAS.—N. America, 1633. Tree 40-50 feet. Leaves very various in shape, sometimes ovate-entire, sometimes cut into 2-3 deep lobes of great diversity of form, all pale green. Flowers in short racemes, dioecious, greenish-yellow. Berries oval, bright blue, on long peduncles. The bark, which is pleasantly aromatic, has been largely used in medicine for its sudorific properties. At present, it is its beautiful leaves, of Protean variety of form, that claim our admiration. It is of doubtful hardiness north of the Trent.



LAURUS SASSAFRAS.

146. LAVANDULA—(*Lavender*).

LABIATÆ—DIDYNAMIA.

1. *Lavandula* SPICA.—S. Europe, 1548. A small shrub (3-4 feet), with hoary, fragrant, persistent leaves, and long spikes of purple flowers. It is extensively grown for distillation, but is also well worth a place in our gardens as a pretty and fragrant shrub. It is associated in our minds with old-fashioned gardens and old-fashioned linen-presses, where strata of lavender-sprigs (of doubtful insectifuge virtue) shed an odour largely intermixed with that of yellow soap.

147. LEDUM.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Ledum* PALUSTRE.—Canada, 1762. Evergreen shrub 2

feet. Leaves linear, margins revolute, with rusty down beneath. Flowers in clusters, numerous, white, stamens exserted. It is found in swamps, but will flourish in common peat-soil, and produce its gay flowers abundantly. The *L. latifolium* is very similar to the *palustre*, but has broader leaves, and the possessor of either may well dispense with the other. It is quite independent of temperature, but it is only in moist peaty spots that it will develop all its floral beauties.

148. LEPTOSPERMUM.

MYRTACEÆ.

1. *Leptospermum LANIGERUM*.—Van Diemen's Land, 1774. Evergreen shrub 6-8 feet. Leaves ovate, pointed, small, of a glaucous hue. Flowers white, sessile, numerous, succeeded by hard globular nuts. A very elegant shrub, nearly if not quite hardy, and highly interesting as a representative of the flora of Australia, most of whose congeners require greenhouse culture. It is only in the severest winters that it is killed to the ground, but it even then throws up strong shoots the ensuing season, which soon produce flowers and berries. This, however, only applies to a climate not colder than that of London. It is probably still untried as an open-air plant in the northern counties.

149. LEUCOTHOE.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Leucothoe SPINULOSA*.—Carolina, 1793. Evergreen shrub 2-3 feet. Leaves large, ovate-oblong, narrowing to the acuminate tip, with obscure and slightly spinulose teeth. Flowers in axillary, unilateral, bracteated racemes, white,

small. The foliage is much larger than is usually the case with the heath tribe, and the flowers are very abundant, though not so showy as in some other genera of the family.

150. LEYCESTERIA.

CAPRIFOLIACEÆ—PENTANDRIA MONOGYNIA.

1. *Leycesteria* FORMOSA.—Nepal, 1824. Shrub 8-10 feet. Leaves ovate, acuminate, of a deep green. Flowers white, small, in bracteated racemes. Berries purple, attended by bracts of nearly the same colour, which form a fine contrast to the bright green of the leaves and shoots. The latter are of a fine grass colour, and very smooth. It pushes up stems freely, and refuses to assume a tree-shape. It is quite hardy in the climate of London, and will probably prove so in all but the highest latitudes of our island.

151. LIBOCEDRUS.

CONIFERÆ—MONCECIA MONADELPHIA.

1. *Libocedrus* CHILENSIS.—Chili, 1848. Tree 50-60 feet. Leaves opposite, in twos, flattened, green at the back and edges, but very glaucous at the sides. Branches flattened, densely clothed with leaves. Cones of four woody scales. An elegant pyramidal tree, tolerably hardy, but of slow growth. The glaucous margins of the leaves are very distinctive and pretty. In 1851 Prince Albert planted a fine specimen at Shrubland Park, an event which Donald Beaton, the prose-poet of gardening in his time, recorded in his characteristic manner in the "Cottage Gardener" for that year. In the northern parts of our island this tree will probably prove tender, and even in the warmest districts it is not likely that it will ever

attain the dimensions to which it reaches in its native mountains.

152. LIGUSTRUM—(*Privet*).

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Ligustrum* CORIACEUM.—Japan, 1864. Evergreen shrub 2-3 feet. Leaves nearly orbicular, entire, very thick and coriaceous, glabrous, very dark glossy green above, paler beneath, densely packed on the short shoots. Flowers small, greenish-white. A most distinct and interesting species, of very slow growth. Its crowded leaves of hard and almost horny consistence quite hide the stem and shoots. It can hardly be expected to live in the open air much north of London.

2. *Ligustrum* JAPONICUM.—Japan, 1846. Evergreen shrub 10-12 feet. Leaves large, broadly ovate, acuminate, glossy. Flowers in large terminal panicles, white, fragrant. A beautiful shrub, well worthy of cultivation; but, not being perfectly hardy, it thrives best against a wall, and fully deserves to enjoy that privilege. Whether, even with that protection, it will stand the rougher winters of North Britain, is very questionable.

3. *Ligustrum* VULGARE.—England. Shrub 8-10 feet, nearly evergreen. Leaves elliptic. Flowers in terminal racemes, white, odorous. This well-known plant forms excellent hedges, as it bears the shears well, and is of rapid as well as of dense growth. The berries, which are dark purple (or in some varieties white or yellow), are very ornamental during winter.

153. LINNÆA.

CAPRIFOLIACEÆ—DIDYNAMIA ANGIOSPERMA.

1. *Linnæa* BOREALIS.—Scotland. Trailing evergreen shrub. Leaves ovate-lanceolate, rather villous, of a dark green. Flowers axillary, flesh-coloured, pendulous, pretty, but by no means showy. This humble though comely plant was selected by Linnæus himself to commemorate his name—a choice very characteristic of the modesty of his nature. Its habitat is chiefly the fir-woods of North Europe, where, in sterile soil, in the shade and under the drip of tall dark-foliaged pines, it freely produces its unpretending flowers.

154. LIQUIDAMBAR.

BALSAMIFLUÆ—MONGECIA POLYANDRIA.

1. *Liquidambar* STYRACIFLUA.—N. America, 1683. Tree 30-50 feet. Leaves palmate, in five deeply-cut lobes, which die off in autumn of a deep purplish red, and give to the tree a very picturesque appearance. Flower in catkins; fruit in echinated globes. It prefers swampy situations. This tree produces a resinous gum of agreeable aroma, and the leaves, when bruised, exhale a fragrant odour. Its timber is of close compact grain, and takes a very bright polish. It deserves much more attention than it has received, as both foliage and form are elegant, whilst its timber is very valuable. The bark sometimes exhibits a corky excrescence. It is quite hardy in the latitude of London, and probably much farther north; but the exact limit beyond which it requires protection has still to be ascertained.



LIRIODENDRON TULIPIFERA—Tulip Tree.

155. LIRIODENDRON—(*Tulip Tree*).

MAGNOLIACEÆ—POLYANDRIA POLYGYNIA.

1. *Liriodendron* TULIPIFERA.—N. America, 1663. Tree 70 feet. Leaves truncated at the top, saddle-shaped, 5 to 7 inches broad, smooth. Flowers large, mostly bright yellow, tulip-shaped; only produced on large trees, but then very numerous and showy. This magnificent tree deserves extensive culture. The foliage is lovely, and distinct from any other; the flowers are brilliant; its size is majestic, reaching in favoured spots 120 feet; its shape most elegant when trained to a single stem; and, finally, its timber is very valuable. Few trees possess so many claims to universal notice, and not the least one is its hardiness, in which it surpasses every other member of the Magnoliaceæ.

156. LOMATIA.

PROTEACEÆ—TETRANDRIA MONOGYNIA.

1. *Lomatia LONGIFOLIA*.—N. S. Wales, 1816. Evergreen tree 20-30 feet. Leaves linear-lanceolate, with irregular dentatures or small lobes, glaucous beneath. Flowers white, in tufted racemes, very interesting from their peculiar shape. This is the only Proteaceous plant ascertained to be hardy in this country, and hence it is a very desirable acquisition. The writer has had a specimen growing in his experimental garden for eighteen years; and although twice during that period, in very severe winters, it has been killed to within a foot of the ground, it has shot up again and grown and flowered as before. It has even frequently ripened its seeds—a solitary instance of a Proteaceous plant reaching such perfection in England in the open air. Of course it can hardly be expected to flourish much north of London; but such are the hidden resources of Nature, that it would be unsafe to predict too dogmatically its inability to cope with a north-country winter until the fact be ascertained by actual experiment.

157. LONICERA—(*Honeysuckle*).

CAPRIFOLIACEÆ—PENTANDRIA MONOGYNIA.

1. *Lonicera BRACHYPODA* v. *AUREO-RETICULATA*.—Japan, 1856. Evergreen twining shrub. Leaves ovate, entire, of a light green, profusely netted with golden-yellow reticulations. Flowers in small sparse axillary corymbs, of a pale pink hue. This much-admired variety rests its claim to notice almost exclusively on its beautiful foliage, which is abundantly produced, the plant being of rapid growth. It will either become scandent if trained against a tree or a trellis, or it will ramble luxuriantly down a declivity and cover a large

space of ground with its "golden tresses." It has hitherto proved thoroughly hardy.

2. *Lonicera* CONFUSA.—Japan, 1805. Twining shrub. Leaves ovate, acute, downy. Flowers white, changing to yellow, numerous, pubescent, very fragrant. Not hardy north of the Trent.

3. *Lonicera* JAPONICA.—China, 1806. Twining shrub. Leaves evergreen, ovate, hairy, pale beneath. Flowers sessile, in twos, axillary, tubular, red outside, white within, very sweet-scented. This is a very robust-growing and hardy species, producing its fragrant flowers for several months in succession.

4. *Lonicera* LEDEBOURII.—California, 1838. Shrub 6-8 feet. Leaves oval-oblong, entire, glossy, reticulated beneath. Flowers reddish-yellow, with two scarlet bracts, on long axillary peduncles. Berries black. It is very hardy, and can be trained into a shapely compact bush.

5. *Lonicera* PERICHYMENUM (Woodbine).—England. A well-known twining shrub, common in hedges, but so beautiful and fragrant as to be an ornament in any garden, for its merits are not the less real from their being so profusely displayed in its wild state.

6. *Lonicera* SEMPERVIRENS (Trumpet Honeysuckle).—N. America, 1656. Evergreen twining shrub. Leaves obovate, glaucous beneath; the upper ones connate, perfoliate. Flowers in short spikes, scarlet outside, yellow inside, tubular, inodorous. It is somewhat tender, and requires a sheltered position, even in the Southern and Midland Counties, but its luxuriant and prolonged inflorescence quite repays the trouble.

158. LYCIUM—(*The Box Thorn*.)

SOLANACEÆ—PENTANDRIA MONOGYNIA.

1. *Lycium* EUROPÆUM.—S. Europe, 1730. A fast-growing

rambling shrub, partaking in some measure of the properties of a climber. Flowers pale violet, streaked with red, succeeded by fruit, purple at first, afterwards scarlet or yellow. The yearly shoots are long and straggling, and the plant is well adapted (and much used) to cover walls and trellises, which it adorns with great effect. It appears to be quite hardy. It may frequently be seen festooning the porches of farm-houses and cottages.

159. LYONIA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Lyonia* ARBOREA.—N. America, 1752. Tree 40-60 feet. Leaves oblong, acuminate, serrated, with a pleasant acid taste, whence the tree has been called the sorrel-tree. Flowers in terminal branched panicles, white, cylindrical. A very distinct and interesting species, towering in size very far beyond any of its congeners. It thrives best in peat-soil. Unlike most large trees, it begins to display its beautiful flowers even when only 5 to 6 feet high. It is the only member of the *Erica* family that assumes the dimensions of a forest tree; and being but little known at present, very few specimens exist in England beyond the size of a shrub.

2. *Lyonia* RACEMOSA.—N. America, 1736. Shrub 4-5 feet. Leaves ovate-lanceolate, serrulated, acute. Flowers in terminal spikes, unilateral, cylindrical, white, fragrant. A very handsome and pleasing plant.

160. MACLURA—(*Osage Orange*).

URTICACEÆ—DIOECIA TETRANDRIA.

1. *Maclura* AURANTIACA.—N. America, 1818. Tree 40 feet. Branches spiny. Leaves large, ovate, of a bright glossy green

colour. Flowers small, greenish. The fruit bears some outward resemblance to an orange ; it is about 3 inches in diameter, of a greenish-yellow colour, and looks beautiful when hanging from the tree, but it is not fit for human food. This tree requires care in transplantation, as the roots are rather coarse, and it frequently succumbs under the process of removal.

161. MAGNOLIA.

MAGNOLIACÆ—POLYANDRIA POLYGYNIA.

1. *Magnolia ACUMINATA*.—N. America, 1736. Tree 40 feet. Leaves oval, acuminate, 6-8 inches long. Flowers large, of various tints, from bluish-green to white, with but little scent. Fruit (which is only occasionally produced in England) about 3 inches long, when green resembling a cucumber, whence its popular name of Cucumber-tree. The wood is of a fine grain and of an orange colour. It is one of the hardiest of the Magnolias, and grows well in Scotland, where, however, it is generally trained against a wall.

2. *Magnolia AURICULATA*.—Carolina, 1786. Tree 40 feet. Leaves heart-shaped, ovate, smooth above, glaucous beneath. Flowers yellowish-white, with an agreeable though not powerful odour. The shape of the leaves, with their auricles at the base, distinguishes this from all other species. It is hardier even than the preceding species, and, in the most northerly parts of our island, only requires the precaution of training it to a wall.

3. *Magnolia CONSPICUA*.—China, 1789. Tree 30 feet. Leaves obovate, acuminate, the younger ones downy. Flowers milk-white, numerous, expanding in February or March, before the leaves. Its habit is that of a large bush, rather than of a tree, and in favourable springs it presents, with its myriad of large white flowers, the appearance, at a distance, of a pyra-

mid of snow. Of this species there are a number of garden varieties, each of which possesses some peculiar feature, but none so distinct as to merit special notice, unless, perhaps, the *C. Lenné*, of which the petals are exteriorly tinged with pale pink. This species is much hardier than was formerly thought, and will thrive in England as a standard, and in Scotland trained to a wall. No shrub will more amply repay the trouble of any protection it may require.

4. *Magnolia* GLAUCA.—N. America, 1688. Tree 20 feet. Leaves nearly evergreen, elliptical, smooth, bluish light-green above, glaucous beneath. Flowers white, fragrant, large. It requires a peat-soil, the damper the better. The beautiful pale green colour of its leaves renders it very attractive, especially when the wind turns up their under side, which is of a fine silvery hue. The flowers exhale a peculiarly delicate perfume. It is tolerably hardy even in the north, as it is found to grow in Scotland with a little occasional protection.

5. *Magnolia* GRANDIFLORA.—Carolina, 1734. Evergreen tree 30-40 feet. Leaves very large, oval-oblong, coriaceous, shining above, rusty beneath. Flowers large, white, fragrant. It flourishes best when trained to a wall, partly on account of the shelter, and partly because standards are liable to have their branches broken by the snow. Of this magnificent and well-known tree, there are several varieties, of which the best are the *G. exoniensis*, *angustifolia*, and *præcox*. The *M. grandiflora* grows and flowers freely in the south and middle of England, but farther north, although it survives the winter, the growth is slower. It is found in various parts of Scotland, but the specimens are small and stunted.

6. *Magnolia* MACROPHYLLA.—N. America, 1800. Tree 35 feet. Leaves very large (sometimes, in very luxuriant plants, 2½ feet long), oblong-obovate, cordate at the base, glaucous beneath. Flowers white, 7-8 inches in diameter;

fragrant. Bark smooth, white. This species, remarkable for its gigantic foliage and flowers, is of slow growth and delicate constitution when young, but once well started, and in a congenial situation, it puts forth its magnificent foliage with great luxuriance, as well as its noble blossoms, both which unfortunately, however, expose so large a surface to the wind as rarely to remain long unscathed. In the more northerly latitudes of our island its growth becomes slow and stunted.

7. *Magnolia PURPUREA*.—Japan, 1790. Shrub 10 feet. Leaves obovate, acute, dark green. Flowers large, purple without, white within, copiously produced. An elegant shrub, of slow growth, but free of flowering, even when small. It is tolerably hardy in the climate of London, but doubtfully so further north.

8. *Magnolia TRIPETALA* (UMBRELLA TREE).—N. America, 1752. Tree 30 feet. Leaves lanceolate, 18 inches long, rather tufted. Flowers large, white, fragrant. As in many of the Magnoliaceæ, the seeds when ripe hang from the carpels by a long slender thread (the umbilical cord), and, being enveloped in a pinkish aril, form beautiful and curious objects. This species is very hardy, but rather short-lived, and, like most short-lived trees, produces its gay flowers before attaining any great size. They crown each tuft of leaves with their pure white fleshy petals, and exhale their fragrance far around. Even in the northern parts of the island, this tree is found to thrive tolerably well.

162. MAHONIA—(*Ash Berberry*).

BERBERIDACEÆ—HEXANDRIA MONOGYNIA.

1. *Mahonia AQUIFOLIUM*.—N.W. America, 1824. Ever-green shrub 6 feet. Leaves pinnate, leaflets 9, ovate, cordate, spiny-toothed, of a deep shining green. Flowers in erect crowded racemes, yellow, abundantly produced in early spring.

succeeded by clusters of roundish black berries covered with a violet bloom. A very ornamental and hardy plant, found very suitable and much used as a cover for game.

2. *Mahonia* JAPONICA.—Japan, 1845. Evergreen shrub 5-6 feet. Leaves pinnate, 12-15 inches long, leaflets 11-15, the two lower ones embracing the stem, with 3-5 spiny teeth on each side, exhibiting a pinkish tinge when first evolved, then becoming pale green, and finally dark green curiously blotched with yellow. Flowers in large racemes, yellow, produced early, succeeded by fine clusters of berries, purple, with a glaucous bloom. This magnificent and ornamental plant grows best in a shady place, and deserves every care. How far it would be able to resist the winters of our more northern districts is open to doubt, and can only be solved by experiment. It dislikes removal, and would probably stand great severity of frost if once well established in a sheltered spot.

3. *Mahonia* NEPALENSIS.—Nepal, 1832. Evergreen shrub 8-10 feet. Leaves very large, pinnate, leaflets 13-15, each with 6 large tough spinose teeth, and terminating in a long very sharp point; thick and coriaceous, of a shining dark green above, paler beneath. Flowers yellow, in crowded racemes. This is perhaps the most ornamental species of a very ornamental genus. It lacks the variegated leaves and the diversified tints of the *M. Japonica*, but greatly exceeds it in elegance of habit. Its noble leaves densely clothe the plant, and pendulously lap over each other in a most charmingly graceful manner. It is rather susceptible of injury from frost, and would probably prove tender in districts much north of London.

163. MALACHODENDRON.

TERNSTRÖMIACEÆ—MONADELPHIA POLYANDRIA.

1. *Malachodendron* OVATUM.—Virginia, 1795. Shrub 12 feet.

Leaves ovate, acuminate. Flowers axillary, cream-coloured, large, petals waved, abundant. It thrives best in a peat-soil and a sheltered situation, and, trained to a single stem, assumes an arborescent form. It produces its brilliant blossoms very freely when well grown, and is then highly ornamental, but it is rather fastidious as to soil and position—more so, perhaps, than as to lowness of temperature.

164. MENISPERMUM—(*Moonseed*).

MENISPERMACEÆ—DIOECIA DODECANDRIA.

1. *Menispermum* CANADENSE.—N. America, 1691. Climbing shrub. Leaves roundish-angular, slightly heart-shaped at base, smooth, on long stalks, light green above, glaucous beneath. Flowers small, in axillary bunches, greenish-yellow. Berries black. The chief feature which distinguishes it is the curious and elegant shape of the leaves. The stem twines very tightly from left to right, and its embraces are often fatal to the tree to which it attaches itself. It appears to be quite hardy.

165. MENZIESIA.

ERICACEÆ—OCTANDRIA MONOGYNIA.

1. *Menziesia* GLOBULARIS.—Virginia, 1806. Evergreen shrub 3-5 feet. Leaves lanceolate. Flowers yellowish-brown, of a globular shape. The branches and leaves are more or less clothed with hairs. It thrives best in peat-soil, and deserves a place in collections of the heath tribe. The plant commonly known as the *Menziesia polifolia* is really the *Dabœcia polifolia*, which see.

166. MESPIIUS—(*Medlar*).

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Mespilus GERMANICA*.—England. Tree 20-30 feet. Leaves oblong-lanceolate, downy beneath. Flowers white, large, solitary. Fruit with large persistent calyxes. In an ornamental point of view, its most distinctive feature is the singularly tortuous forms assumed by its branches. But its foliage, flowers, and fruit have each their claims to notice.

Mespilus CANADENSIS. (See AMELANCHIER BOTRYAPIUM).

167. MORUS—(*Mulberry*).

URTICACEÆ—MONOECIA TETRANDBRIA.

1. *Morus ALBA*.—China, 1596. Tree 30-40 feet. It is of more rapid growth than the common or black-fruited Mulberry, but its fruit, which is white, is hardly fit for human food. The leaves are largely used in France and Italy for feeding silkworms, for which purpose, however, some of the cultivated varieties are found more useful, especially the *A. multicaulis* and *A. Morettiana*. Of both these (though varieties of the Alba) the fruit is black and edible.

2. *Morus NIGRA* (the Common Mulberry).—Persia, 1548. Tree 30 feet. Leaves heart-shaped, rough, and coarsely serrated. The fruit is dark purple, and is well known for its grateful flavour and wholesomeness. This tree is of slow growth, but very long-lived. It presents, from its close thick branches and its deficiency in height, a somewhat stunted appearance. It is very hardy; indeed Sir Thomas Browne, in 1663, quotes a letter from an Iceland clergyman, which testifies to the Mulberry being one of the few trees growing in that semi-polar region, adding, however, "quanquam libenter do has arborum species non altius assurgere quam ut virgulta meritò dicantur."

3. *Morus RUBRA*.—N. America, 1620. Tree 50-60 feet. Leaves heart-shaped, serrated. Fruit oblong, deep red, and of agreeable taste. It is a taller tree than any of the other Mulberries, and its thick foliage affords a deep shade. The leaves are generally entire, but are occasionally found cut into two or three irregular lobes. It is of rapid growth when once established, but is rather impatient of transplantation.

168. MYRICA—(*Candleberry Myrtle*).

MYRICACEÆ—DIOECIA TETRANDRIA.

1. *Myrica CALIFORNICA*.—California, 1844. Evergreen shrub 10-12 feet. Leaves elliptic-lanceolate, slightly serrated, coriaceous, smooth. Male catkins sessile, axillary. A very fine evergreen, preferable in several respects to the older species. It seems to be tolerably hardy, and is a decided acquisition to our gardens. Whether it will stand the winters much north of London, is, however, still questionable.

2. *Myrica CERIFERA*.—N. America, 1699. Evergreen shrub 10-15 feet. Leaves larger and more serrated than those of *M. Gale*. Fruit small berries covered with a white unctuous substance, from which, by pouring boiling water on them, a species of wax is obtained. Candles made of this wax burn well and yield a grateful fragrance, but, like many other vegetable productions, they have been superseded and displaced by cheaper chemical processes.

3. *Myrica GALE*.—England. Shrub 4-5 feet. Leaves obovate-lanceolate, rigid, fragrant when bruised. The catkins are formed during the summer, remain on through the winter, and expand early the following spring. The berries are very small. This plant thrives best in swampy places.

169. MYRICARIA—(*German Tamarisk*).

TAMARICACEÆ—MONADELPHIA DECANDRIA.

1. *Myricaria* GERMANICA.—Europe, 1582. Shrub 8-10 feet. Leaves linear-lanceolate, sessile, almost evergreen. Flowers rose-pink, in terminal spikes, abundant. Very similar to the common tamarisk, but differing in a few botanical peculiarities. It thrives well on the sea-shore, but, unless carefully pruned and trained, has a straggling habit of growth. No doubt it is hardy, even in the higher latitudes of our island.

170. MYRTUS—(*Myrtle*).

MYRTACEÆ—ICOSANDRIA MONOGYNIA.

1. *Myrtus* COMMUNIS.—S. Europe, 1597. Evergreen shrub 6 feet. Leaves ovate, of a glossy green, with minute transparent dots, fragrant when crushed. Flowers white, conspicuous in the number of their stamens. There are several varieties of this beautiful shrub, the hardiest of which is probably the *C. Romana*. With a little protective care, this favourite shrub may be preserved through winter, and in favourable seasons will blossom more profusely when in the open ground than under glass. In Sir Stephen Fox's garden at Chiswick there were, in 1691, two myrtle-hedges about three feet high, protected in winter by cases of boards. In the south-western districts of England and Ireland fine specimens exist, but farther north its power of surviving the frosts and keen blasts of winter collapses, and the greenhouse becomes its only safe refuge.

171. NEGUNDO—(*Box Elder*).

ACERACEÆ—DICECIA PENTANDRIA.

1. *Negundo* FRAXINFOLIUM.—N. America, 1688. Tree 60 feet. Nearly allied to the Acers, from which it chiefly differs in its being dicecious and the leaves pinnately divided. Flowers small, green, in pendulous racemes. The young branches are smooth, and of a beautiful light green colour, almost presenting the appearance of rushes. It grows with great rapidity when young. It has been alleged that it is a short-lived tree, but one planted at Fulham Palace in 1688, by good old Bishop Compton, was, in 1809 (120 years later), still flourishing, and the trunk then measured seven feet in circumference. The blotched-leaved variety is very ornamental, the foliage being almost entirely white, and thence presenting a most remarkable contrast to the surrounding foliage. Both the species and its variety appear to be quite hardy.

172. NITRARIA.

MALPIGHIACEÆ—DODECANDRIA MONOGYNIA.

1. *Nitraria* SCHOBERI.—Siberia (borders of salt lakes), 1788. Shrub 6-8 feet. Leaves small, oblong, entire, glaucous. Flowers white, freely produced. Berries black. Curious as a type of the peculiar flora of South Russia and Siberia, in the nearly barren districts where salt lakes abound. Its vigour is promoted by occasionally scattering a little salt on the soil around its roots.

173. NYSSA—(*Tupelo Tree*).

SANTALACEÆ—DECANDRIA MONOGYNIA.

1. *Nyssa* VILLOSA.—N. America, 1824. Tree 60-70 feet.

Leaves oblong, acute, entire, hairy on the margins, changing to scarlet before dying off. Flowers small, two together on long peduncles. Fruit in pairs, of a deep blue colour, very persistent. It forms an elegant tree, and both foliage and fruit are interesting. It appears to be proof against frosts, but thrives best in a rather damp situation.

174. OLEA—(*Olive*).

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Olea ILICIFOLIA*.—Japan, 1852. Evergreen shrub 3-4 feet. Leaves of a light green, shining, spiny-toothed, somewhat resembling those of the holly, but the dentatures smaller and more numerous, and the margins not waved. Flowers white, axillary, fragrant. This is a lovely shrub, very recently introduced, which bids fair to become a general favourite. So far, it has proved quite hardy in the neighbourhood of London. It represents that interesting tribe, the Olive, but is hardier and much more ornamental than the *Olea Europæa*, to which it bears no outward resemblance, but only a botanical affinity.

175. ONONIS—(*Rest-harrow*).

LEGUMINOSÆ—MONADELPHIA DECANDRIA.

1. *Ononis FRUTICOSA*.—S. France, 1680. Shrub 2-3 feet. Leaves trifoliate, leaflets lanceolate, serrated. Stipules large. Flowers purplish-red. A curious ligneous species of a tribe that is generally herbaceous. It grows and blooms freely, and is really a woody shrub, though it has much the appearance of an herbaceous plant. It produces its handsome flowers very abundantly.

176. OREODAPHNE.

LAURACEÆ—ENNEANDRIA MONOGYNIA.

1. *Oreodaphne* CALIFORNICA.—California, 1860. Evergreen shrub 20-30 feet. Leaves large, 5-7 inches long, lanceolate, entire, dark green, the midrib very conspicuous, fragrant when bruised. Flowers small, greenish. The hardiness of this shrub has not yet been sufficiently tested, but it will probably be found to resist our winters quite as well as the bay-tree or the common laurel. If so, it will be a splendid addition to our gardens, as few plants surpass it in elegance of foliage.

177. ORNUS—(*Flowering Ash*).

OLEACEÆ—POLYGAMIA DICECIA.

1. *Ornus* EUROPÆA.—S. Europe, 1730. Tree 20-30 feet. Leaves pinnate, leaflets 6-9, elliptic, serrated, somewhat downy beneath. Flowers in drooping panicles, greenish white, ornamental. When grafted on the ash, the stock, being a more rapid grower, swells considerably beyond the graft and presents a curious appearance. It is a very elegant tree, with fine light green foliage, slightly pendulous, and large drooping bunches of flowers, individually small, but in the mass very effective. The variety *E. rotundifolia* (by some considered a distinct species) differs mainly in the leaflets being rounder and the growth less vigorous.

178. OSMANTHUS.

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Osmanthus* ILICIFOLIUS.—Japan, 1853. Evergreen shrub

5-6 feet. Leaves very similar to those of the common Holly, but the dentatures deeper and less wavy. Flowers white, small, axillary or terminal. Like many other Japanese plants, the leaves are very susceptible of variegation, and hence a number of different forms of it are under cultivation. It has great affinities to the *Olea ilicifolia*, but is easily distinguished by the dentatures of the leaves being fewer, larger, and the leaves themselves of a deeper green, than those of the latter, and consequently bearing a stronger resemblance to the common holly. This beautiful evergreen has hitherto proved perfectly hardy in the climate of London, so much so that it may be fairly assumed that it will stand the winters of North Britain. At all events, this will soon be ascertained, as its cultivation is becoming more general.

179. OSTRYA—(*Hop Hornbeam*).

CORYLACEÆ—MONŒCIA POLYANDRIA.

1. *Ostrya* VULGARIS.—Italy, 1720. Tree 30-50 feet. Leaves ovate, serrated, pointed, smooth, somewhat plaited. The female catkin is cylindrical, with close imbricated bracts, resembling that of the hop, which give it a distinctive and handsome appearance when in fruit. It grows freely and is perfectly hardy. In its habit of growth it much resembles some species of the Elm.

180. OXYCOCCUS—(*Cranberry*).

ERICACEÆ—OCTANDRIA MONOGYNIA.

1. *Oxycoccus* MACROCARPUS.—N. America, 1760. Small evergreen trailing shrub. Leaves small, elliptic, coriaceous, minutely serrated, glaucous underneath. Flowers axillary, drooping, white; stamens long, segments of corolla reflexed.

Berries globular, red, edible. A swamp-plant, requiring wet peat-soil in order to thrive well. It is a very pretty plant, with trailing filiform stems, handsome flowers and bright red berries, which are used for the same purposes as the common cranberries—viz. for tarts and preserves.

181. PÆONIA—(*Peony*).

RANUNCULACEÆ—POLYANDRIA DIGYNIA.

1. *Pæonia* MOUTAN.—China, 1789. Shrub 6-8 feet. Leaves large, bipinnate, leaflets smooth, glaucous beneath. Flowers very large and semi-double, white, with a purple spot at the base of each petal. There are a great number of hybrid varieties of this magnificent flowering shrub, from which selections can be made. All of them possess considerable beauty. As the flowers are developed early, they are occasionally injured by spring frosts and cold winds.

182. PALIURUS—(*Christ's Thorn*).

RHAMNACEÆ—PENTANDRIA TRIGYNIA.

1. *Paliurus* ACULEATUS.—S. Europe, 1596. Tree 20-30 feet. Leaves small, ovate, smooth, with 2 sharp spines at the base, one straight, the other recurved. Flowers small, yellowish, in axillary bunches. Fruit of a curious shape, something like a hat in miniature. The long, slender, wavy, pliant, spiny branches, give the plant an air of great elegance. It is of slow growth, and usually retains a shrubby habit. It is tolerably hardy, except in the northern parts of the island, where it may require some protection during winter.

183. PANAX.

ARALIACEÆ—POLYGAMIA DIGECIA.

1. *Panax* HORRIDUM, or *Echinopanax* HORRIDUM.—N. America, 1829. Shrub 8-10 feet. Leaves large, nearly orbicular, wrinkled, rough, with spiny setæ, and somewhat large serratures. Flowers in racemose panicles, of a greenish white, succeeded by reddish flattened berries. The stem is prickly, as is the case with several of its congeners, and it is the singularity, more than the beauty of the plant which constitutes its attraction. It is quite hardy, but its large leaves occasionally get torn by violent winds.

184. PASSIFLORA—(*Passion-Flower*).

PASSIFLORACEÆ—MONADELPHIA PENTANDRIA.

1. *Passiflora* CÆRULEA.—Peru, 1699. Climbing plant of rapid growth. Leaves palmate with strong tendrils. Flowers, blue, large, of well-known elegance and singularity. Trained to a wall, and with some protection to the stem in very severe weather, this plant will thrive and flower freely in most parts of England, and, if not as gorgeous as its congeners under glass, it has the immense advantage of disporting itself freely in the open air, and casting its vestment of beauty over our house-walls. It can hardly be expected to thrive much north of London, unless in warm situations and well protected.

185. PAULOWNIA.

SCROPHULARIACEÆ—DIANDRIA MONOGYNIA.

1. *Paulownia* IMPERIALIS.—Japan, 1840. Tree 40-50 feet.

Leaves very large, cordate, broadly ovate, on long footstalks. Flowers in large terminal panicles, violet, with brown spots and yellow striæ, fragrant. The buds are produced in autumn, and consequently are often injured by the winter frosts, otherwise they expand in early spring before the foliage is developed. The flowers are very showy, and bear some resemblance to those of the Foxglove. The foliage is of immense size, especially in young trees, occasional leaves being found measuring nearly a foot in diameter. In its early stage the growth of the tree is most rapid, reaching 6 or 8 feet in a season. As it increases in size, the shoots are shorter, and the leaves lose something of their dimensions; but the tree retains the distinction of having the largest leaves and the finest flowers of any hardy tree known, not excepting the beautiful *Catalpa syringæfolia*. It flourishes best in the southern counties, gets more stunted, and less likely to flower in the midland districts, and becomes tender in the northern parts of the island.

 186. PAVIA.

SAPINDACEÆ—HEPTANDRIA MONOGYNIA.

1. *Pavia CALIFORNICA*.—California, 1856. Tree 20 feet. Leaves palmate, folioles 5-9, serrated. Flowers in terminal panicles, densely clothed with blossom, white, with conspicuous stamens. A fine species, quite hardy, and continuing long in blossom. It is likely to become a great favourite when better known.

2. *Pavia DISCOLOR*.—Georgia, 1812. Small tree 5-6 feet. Flowers two-coloured (red and yellow), large, showy, and very abundant, and hence the tree (or rather shrub) is very ornamental. The whole plant is more or less covered with pubescence. It is probably not hardy north of the Trent.

3. *Pavia* MACROSTACHYA.—N. America, 1820. Shrub 10 feet. Flowers white, with long projecting stamens, in tall spikes, very fragrant. The leaves are on long slender petioles, and combine with the flowers to give this shrub a very elegant appearance. The petioles are occasionally winged, or widened out in a curious manner. It is altogether a very desirable plant, and appears to be quite hardy.

4. *Pavia* RUBRA.—Virginia, 1711. Tree 20-30 feet. Leaves smooth, but in other respects resembling those of the Horse-chestnut, from which the genus *Pavia* mainly differs in its fruit being smooth, whereas the fruit of the former is echinated or prickly. Flowers approaching to scarlet.

187. PERIPLOCA.

ASCLEPIADACEÆ—PENTANDRIA DIGYNIA.

1. *Periploca* GRÆCA.—S. France, 1597. Climbing shrub. Leaves ovate, glossy green. Flowers in long-peduncled corymbs, hairy, or velvety, of a rather lurid brown, abundantly produced. This beautiful plant is of rapid growth, and, under favourable circumstances, climbs to the height of 50 or 60 feet. The flowers exhale a peculiar odour, which disagrees with some persons, and is said to be positively deleterious to house-flies and some other insects. It appears to be quite hardy.

188. PERNETTYA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Pernettya* MUCRONATA.—Tierra del Fuego, 1828. Evergreen shrub 2-3 feet. Leaves ovate, coriaceous, shining, toothed, stiff, of a dark green. Flowers white, drooping, abundant, succeeded by beautiful scarlet globular berries.

A very elegant little shrub, which thrives best in a peat-soil, and is generally covered with such a profusion of flowers and berries as to be ornamental at all times of the year. The variety *M. speciosa* is chiefly distinguished by the still greater abundance of flowers which it produces. They are, however, individually smaller, and are not followed by a proportionate abundance of berries: Both plants have hitherto proved perfectly hardy.

189. PHILADELPHUS—(*Mock Orange*).

PHILADELPHACEÆ—ICOSANDRIA MONOGYNIA.

1. *Philadelphus* CORONARIUS.—S. Europe, 1548. Shrub 10-15 feet. Leaves ovate, acuminate, serrated, deep green above, paler beneath, of a flavour when tasted rather similar to the fruit of the Cucumber. Flowers in loose bunches, of a creamy white, with a smell somewhat like that of the orange-blossom. It is sometimes known as the Syringa.

2. *Philadelphus* GRANDIFLORUS.—N. America, 1811. Shrub 10-12 feet. Leaves ovate, acuminate, dentated, 3-nerved. Flowers, two or three together, white, very large and ornamental, but scentless. The variety *speciosissimus* has the largest flowers, and they are borne most abundantly. When in blossom, this shrub produces a most dazzling effect. All the species seem to be quite able to bear our winters.

3. *Philadelphus* VERRUCOSUS.—N. America, 1800. Shrub 10-15 feet. Leaves elliptic, acuminate, dentated, pubescent, and warty beneath. Flowers in racemes, white, very abundant, and showy. A pretty and very hardy flowering shrub.

190. PHILLYREA.

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Phillyrea* ILICIFOLIA (or LATIFOLIA SPINOSA).—S. Europe, 1597. Evergreen shrub 10-15 feet. Leaves ovate-oblong, coriaceous, glossy, sharply cut, so as to give them a somewhat holly-like shape. Flowers inconspicuous, but the dense, shining, dark green foliage of the shrub confers on it quite a distinctive character.

2. *Phillyrea* LATIFOLIA.—S. Europe, 1597. Evergreen tree 20-30 feet. Leaves ovate, serrated, of a deep glossy green. Flowers small, of a greenish colour. It assumes a bush-like form, unless trained to one stem, but as a tree it is very distinct and ornamental.

3. *Phillyrea* MEDIA.—S. Europe, 1597. Evergreen shrub 10-15 feet. Leaves lanceolate, dark green, coriaceous, stiff. Flowers greenish-white, minute. A compact leafy bush, perfectly hardy, as indeed are all the three species. The dense foliage and close habit of all the Phillyreas make them admirably suitable for the formation of hedges, were they not at present so scarce and dear.

 191. PHLOMIS—(*Jerusalem Sage*).

LABIATÆ—DIDYNAMIA.

1. *Phlomis* FRUTICOSA.—Spain, 1596. Evergreen shrub 6-8 feet. Leaves grey, wrinkled. Flowers yellow, in whorls. This shrub is very noticeable from its grey foliage, similar to that of sage; as also from its numerous verticillate flowers. It requires a sheltered situation, or protection during severe frosts; and it is only in the southern counties that its cultivation out of doors can be recommended.

192. PHOTINIA.

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Photinia* SERRULATA.—Japan, 1804. Evergreen tree, 15-20 feet. Leaves oblong, acute, serrated, coriaceous, of a fine deep green. Flowers white in terminal corymbs. It requires a sheltered situation, as its large delicate leaves, at their early expansion, suffer from the vernal east winds. It is quite worthy of space against a wall, where it would no doubt flourish and retain its foliage uninjured. The young leaves are very tender and fragile, and have a beautiful metallic tinge, which the easterly winds in spring soon tarnish and scorch up. It is only in sheltered spots in the south or west of England that it can be expected to flourish.

193. PHYLLODOCE.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Phyllodoce* TAXIFOLIA.—Scotland. Evergreen shrub 1 foot. Leaves linear, slightly toothed. Flowers terminal, globular, blue or purple. A pretty low trailing shrub, requiring a peaty soil. It is a worthy member of a large family, not one of which is devoid of beauty.

194. PINUS—(*Pine*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Pinus* AUSTRIACA.—Austria, 1835. Tree 100-120 feet. Leaves in twos, slender, straight, 4-5 inches long, sharp-pointed, rough at the edges, and thickly set. It forms a majestic, bushy, and well-proportioned tree, is very hardy and of fairly rapid growth. It will thrive in almost any soil, and, from its vigour and density, more rapidly forms a screen, or affords shelter,

than almost any other Conifer. We are informed by Loudon that this pine was first introduced into Britain by Mr. Lawson of Edinburgh in 1835.

2. *Pinus BANKSIANA* (LABRADOR PINE).—Canada, 1780. Low tree or bush 10-20 feet. Leaves in twos, 1-1½ inch long. Cones 2 inches long, recurved, twisted. In Nova Scotia it is called the Scrub Pine. In its mode of growth it is curious and interesting, from the peculiar curl of its branches as well as of its cones, which almost gives the idea of rams' horns. It is one of the hardiest of the pines, and endures the most northerly climate.

3. *Pinus BENTHAMIANA*.—California, 1847. Tree 150-200 feet. Leaves in threes, very stout, 11 inches long, rather flat. Sheaths nearly 1 inch in length. Cones clustered, 6 inches long. The two and three years' shoots seamed with scars left by the fallen leaves. Branches spreading, stout, with a rough bark. A majestic tree, thriving best in mountainous districts, and producing excellent timber. Judging from analogy, it may be confidently hoped that this noble pine will prove quite hardy in our climate. If so, and when more widely disseminated, it will introduce quite a new and striking feature into our landscapes.

4. *Pinus BRUTIA* (CALABRIAN PINE).—Italy, 1845. Tree 50-60 feet. Leaves in twos, rarely in threes, 6-8 inches long, very slender and wavy, of a light green colour. Cones in clusters, 2-3 inches long. Its long, slender, wavy leaves form its chief attraction. It is tolerably hardy in our southern counties, but requires some protection when planted in the north.

5. *Pinus CEMBRA*.—Switzerland, 1746. Tree 50-80 feet, of very slow growth. Leaves in fives, rarely in threes, 2-3 inches long, three-ribbed (one rib glossy green, the other two white), erect. The flowers and cones finely coloured, violet and bright purple respectively. It is easily distin-

guished by its stiff, conical, fastigiata form of growth, and by its numerous short and adpressed branches. The seeds are edible, and are largely used by the Swiss peasantry. It is quite hardy throughout England and Scotland.

6. *Pinus EXCELSA*.—Nepal, 1823. Tree 90-120 feet. Leaves in fives, 6-8 inches long, very slender, and mostly drooping, of a glaucous green; sheaths, about $\frac{1}{2}$ -inch long, caducous. Very similar to the *P. strobus*, but the leaves are much longer and sheaths rather more persistent. Cones 6-9 inches long. The bark of the one to three years' wood feels peculiarly soft and elastic. It appears to be as hardy as the *P. strobus*, whilst it is more elegant in its foliage and habit, and grows more rapidly.

7. *Pinus INSIGNIS*.—California, 1833. Tree 80-100 feet. Leaves in threes, 4-6 inches long, slender, twisted, thickly set, and of a peculiar grass-green colour. Cones $3\frac{1}{2}$ inches long, pointed, and in clusters. This beautiful tree requires a sheltered but not low or damp situation, as it is impatient of frosty winds. Even in our southern counties, many a fine specimen has, after a few years' luxuriant growth, been destroyed by one night's intense frost. The risk of such disappointment has deterred many a lover of the tree from planting it, and it certainly requires some courage to face the chance of losing a favourite plant, and leaving a vacancy in some prominent spot in a plantation. But if planted young, in a dry soil, and a somewhat elevated locality, sheltered by other trees, it is very likely to resist all adverse influences, and when it has attained a certain size, it seems like many other Conifers to become much hardier. There are some fine old specimens of it at Dropmore and a few other places.

8. *Pinus JEFFREYI*.—California, 1848.—Tree 120-150 feet. Leaves in threes, 8-9 inches long, drooping at the ends, very sharp-pointed. Cones large, conical, 8 inches long, with stout, long, hooked scales. Branches horizontal and rather slender.

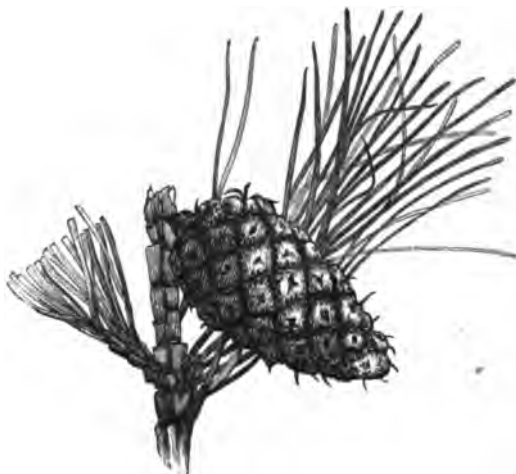
A fine tree, of vigorous growth even on poor sandy soil. It bears some resemblance to the *P. macrocarpa*, both being of gigantic growth and noble aspect, and it will no doubt prove quite as hardy as that species.

9. *Pinus* LAMBERTIANA.—N.W. America, 1827. One of the tallest of the genus, reaching 150-200 feet in height, with a trunk of 10-15 feet in diameter. Leaves in fives, 4-5 inches long, stiff, of a dull green; sheaths very short, obsolete on the old leaves. Cones large, 13-16 inches long, seeds edible and of pleasant flavour. Its most vigorous growth is in purely sandy soil. It has not been planted here very extensively, so that its degree of hardiness has not been ascertained, but it most probably will be found quite insensible to the cold of our climate.

10. *Pinus* LARICIO (CORNICAN PINE).—Corsica, 1759. Tree 80-100 feet. Leaves in twos, but in some rare instances in threes, 5-7 inches long, of a bright but rather dark green, those on the young shoots waved and twisted. Cones 2-3 inches long, commonly in pairs. Its handsome form, abundant foliage, and rapidity of growth, entitle it to a place in every plantation. The timber is useful and durable, and is highly prized in France, where it is more abundant than with us. Notwithstanding its southern origin, it is quite hardy, and thrives even in the Highlands of Scotland. This valuable tree has been most unaccountably neglected. Even for the mere production of timber, it ought to be extensively planted.

11. *Pinus* MACROCARPA (or COULTERI).—Californian mountains, 1833. Tree 80-100 feet. Leaves in threes, 10-12 inches long, stout and stiff, pointed, incurved, and of a glaucous grey colour. Cones very large, 12-13 inches long, and frequently weighing 3 to 4 lbs. each, with strong, spiny, hooked scales. A majestic tree, remarkable for the length and colour of its leaves, as well as for the size and form of its cones. It grows with great vigour, and deserves to be

extensively planted, as it appears, so far, to be quite hardy. Even in its early stages it impresses the beholder with a sense of its massive strength and majestic aspect.



PINUS MITIS.

12. *Pinus* MITIS (Yellow Pine).—New England, 1730. Tree 60 feet. Leaves in twos, occasionally in threes, 2-2½ inches long, of a pale yellowish green, and stiff. From the variable number of leaves in a sheath (which diversity rarely occurs in pines) it has been called *P. variabilis*, and sometimes *P. intermedia*; and this peculiarity renders it easily distinguishable. It is a beautiful tree, and is highly prized for its timber. The cones are solitary and small (about 2½ inches in length). It is quite hardy.

13. *Pinus* MUGHUS.—Austria. Small tree 15-20 feet. It is probably only a variety of the *sylvestris*, which it closely resembles, but the scales of the cones are much more prominent, and it is of a dwarf habit. It might be utilised where the growth of an evergreen underwood would be desirable.

14. *Pinus* PINASTER (Cluster Pine).—S. Europe, 1596.

Tree 60-80 feet. Leaves in twos, 6-8 inches long; broad, stout, of a light green colour, slightly serrated. Cones in star-like clusters, whence the specific name. Thrives and grows very rapidly in sandy soil. Buds white, woolly, with recurved scales, and young stems purplish. A very elegant and distinct pine, well deserving more notice than it has received. It is cultivated in large masses in the Landes, near Bordeaux, where it is tapped for its resinous juices. It withstands the sea-breezes better than most other pines. One planted in 1688 by Bishop Compton in the grounds of Fulham Palace had in 1835 attained a circumference of nearly 12 feet. It appears quite proof against our frosts, and some good specimens are found in Scotland, especially in the vicinity of the sea. Why so useful, so hardy, and so rapidly-growing a tree should have been so neglected, it is difficult to explain.

15. *Pinus* PINEA (Stone Pine).—Italy, 1548. Tree 50-60 feet. Leaves in twos, 5-8 inches long, straight, robust, nearly cylindrical, of a deep green. Cones 5-6 inches long. Seeds large, edible, of pleasant taste, in a hard shell. It is of slow growth, and when old it forms a round head on a naked stem, and presents a peculiar bushy aspect, of which painters of Italian landscapes have availed themselves by frequently introducing its picturesque contour in their pictures. On the young plants the leaves (or apparent leaves, for in reality they are provisory stipules) are quite different from the permanent ones, which only begin to appear from two to four years after the birth of the seedling. During this period the plant is rather tender and very impatient of removal. Afterwards it proves quite hardy in the climate of London, and tolerably so farther north in sheltered situations.

16. *Pinus* PONDEROSA.—N.W. America, 1826. Tree 100 feet. Leaves in threes, 8-10 inches long, twisted, rather

broad; scales of the leaves persistent. Cones $3\frac{1}{2}$ inches long, in clusters. It is a noble tree, of rapid growth, and its timber is remarkably heavy (sufficiently so to sink in water), whence its specific name. It is quite hardy, and is found to thrive in Scotland quite as well as in England.

17. *Pinus* *RADIATA*.—California, 1830. Tree 100 feet. Leaves in threes, very slender, twisted, thickly set, 3-4 inches long, and of a deep green colour. Cones 6 inches long, uneven at the base. This tree bears some resemblance to the *P. insignis*, but the cones are larger and the leaves much shorter, and it probably is somewhat hardier than that species.

18. *Pinus* *RIGIDA* (Pitch Pine).—Eastern America, 1750. Tree 50-60 feet. Leaves in threes, $3-4\frac{1}{2}$ inches long, stiff, acuminate, spreading, light green. Cones in clusters. Its branches are very numerous, and the timber is in consequence full of knots. It is exceedingly resinous, and yields tar abundantly, whence its common name of Pitch Pine. It is quite hardy, and of vigorous growth in its younger stages.

19. *Pinus* *SABINIANA*.—California, 1832. Tree 100-120 feet. Leaves in threes, rather slender, 10-12 inches long, of a glaucous grey colour, which peculiar hue distinguishes the tree from others at a great distance. Cones ovate, 9-10 inches in length, of which the scales bear a very strong, sharp, incurved point. It is a very distinct and elegant species, and, as far as our present experience goes, is perfectly hardy. Intermingled with other species, the peculiar colour of its foliage offers striking contrasts.

20. *Pinus* *STROBUS* (Weymouth Pine).—N. America, 1705. Tree 100-130 feet. Leaves in fives, 3-4 inches long, soft, slender, of a light bluish green, and having the peculiarity of being almost without sheaths. Branches with a smooth shining bark. Cones 5-6 inches long. It has a peculiarly light and elegant appearance. It affects wet and swampy

situations, in which its growth is very rapid and it attains its maximum development. In dry soils its growth is less vigorous, but the quality of the timber is better. It is perfectly hardy under our latitudes.

21. *Pinus SYLVESTRIS* (Scotch Fir).—England. Tree 60-100 feet. Leaves in twos, 2-3 inches long—more glaucous than most of those pines which have their leaves in pairs. They last on the trees four years, and as they get older get darker, and acquire that sombre hue which characterises the tree. It is more useful than ornamental, except in wild mountainous scenery, where it often produces striking effects. Few trees have a wider geographical range. It constitutes vast forests in the northern zones of Europe, and is also found in quantities in the central district extending from the Pyrenees to the Caucasus. A curious variety of it (the *S. monophylla*) has the two sister-leaves joined together, and presents the apparent anomaly of a pine with a single leaf in a sheath.

195. PIPTANTHUS.

LEGUMINOSÆ—DECANDRIA MONOGYNIA.

1. *Piptanthus NEPALENSIS*.—Nepal, 1821. Shrub almost evergreen, 10-12 feet. Leaves trifoliate, large, of a bright deep green, the young ones silky. Flowers yellow, large, individually somewhat similar to those of the Laburnum. It is a little tender, and thrives best against a wall, but, from the great elevation at which it naturally grows, it will probably resist, with some protection, the winters of our more northerly districts.

196. PISTACIA—(*Pistachio*).

ANACARDIACÆ—DICECIA PENTANDRIA.

1. *Pistacia VERA*.—Syria, 1770. Tree 20 feet. Leaves

pinnate, leaflets 3-5, ovate, on long petioles. Fruit oval, about the size of an olive, edible, but not produced in England. Indeed the tree itself requires a dry sheltered situation or the protection of a wall, but its ornamental foliage repays the trouble, for when well grown it is a most beautiful shrub, although the flowers are inconspicuous, and no fruit can be expected in this climate. It can only be trusted in the open air in our most favoured and southerly districts.



PISTACIA VERA.

197. PLANERA—(*Zelkova Tree*).

ULMACEÆ—POLYGAMIA MONŒCIA.

1. *Planera ACUMINATA* (ULMUS KAKI).—Japan, 1865. Tree 60-70 feet. Leaves ovate-lanceolate, acuminate, serrated, on long petioles, which, as well as the young shoots, are of a bright

red. The twigs, yielding to the alternate leaves, acquire thereby a curious zigzag form. Inflorescence not yet accurately ascertained. As far as our knowledge has reached, this tree, which forms immense forests in the northern islands of the Japanese Empire, is deserving of every care and attention, as, if hardy (of which there is little doubt), it will prove both useful as a timber tree and ornamental in our plantations.

2. *Planera* RICHARDI.—S. Russia, 1760. Tree 50-70 feet. Leaves elliptic, unequal at the base (like the elms), very evenly and equally crenated (not dentated). Flowers small, greenish, axillary. The trunk, which is marked with longitudinal furrows, is not enlarged at the base as in most trees, but is of nearly the same diameter up to the point whence the branches diverge. The timber is hard, heavy, and durable; the foliage is both elegant and peculiar; it is of fairly rapid growth; it is very hardy; and, as a logical deduction from these premises, it is highly deserving of more general cultivation.

198. PLATANUS—(*Plane*).

PLATANACEÆ—MONŒCIA POLYANDRIA.

1. *Platanus* OCCIDENTALIS.—N. America, 1636. Tree 70-80 feet. Leaves 5-angled (hardly lobed), dentate, the petioles red. Not quite so hardy as the Oriental Plane, nor does it attain so great a size, except near water, and there its rate of growth is quite extraordinary. The fruit is smoother and much larger than that of the *P. Orientalis*.

2. *Platanus* ORIENTALIS.—Levant, 1548. Tree 70-80 feet. Leaves large, cut into 5 deep lobes, on long green petioles. Flowers in globular catkins, each catkin or ball containing a number of very minute flowers. These globes or balls remain

on the tree till spring, when they open and the seeds disperse. It is a rapid-growing tree, both majestic and graceful in its appearance, and bears the smoke of cities so remarkably well that fine specimens are to be found in the most closely-built and confined spots in large towns. Both species are thoroughly hardy in all parts of Great Britain, save in such exceptionally severe seasons as that of 1813-14.

199. PODOCARPUS.

CONIFERÆ—DICECIA MONADELPHIA.

1. *Podocarpus* KORAIANA.—Japan, 1850. Shrub 2-3 feet. Leaves linear, $1\frac{1}{2}$ -2 inches long, stiff, leathery, pointed, of a deep green. Branches erect, very leafy. A compact, fastigate bush, of neat, trim appearance. On its first introduction it was thought to be a *Taxus*, and called *T. Japonica*.

2. *Podocarpus* NUBIGENA.—Chili, 1848. Tree 30 feet. Leaves linear, $1-1\frac{1}{2}$ inch long, thick, flat, pointed. Fruit drupaceous, oblong, axillary. From its growing at high altitudes in the Andes of Patagonia, we may expect this tree will prove tolerably hardy, and if so, its peculiar foliage will render it a valuable acquisition.

3. *Podocarpus* TOTARA.—New Zealand, 1838. Tree 60-80 feet. Leaves linear-lanceolate, rigid, very sharp-pointed, $1-1\frac{1}{2}$ inch long, spreading in all directions, light green above, glaucous below. Fruit a drupe, axillary. This interesting tree is supposed to be hardy, but the fact has not yet been sufficiently tested. It is well worth the trial, as it would be a fine type of the Australian forms of coniferous vegetation.

All three species are only doubtfully hardy, and there appears little hope of their being domesticated in this country, unless it be in the south and west.

200. POLYGALA—(*Milkwort*).

POLYGALACEÆ—DIADELPHIA OCTANDRIA.

1. *Polygala* CHAMÆBUXUS.—Austria, 1658. An evergreen procumbent plant, with yellowish flowers, resembling those of the Sweet Pea. Of slow growth, and succeeding best, or perhaps only, in peat-soil. The size and beauty of the flowers, as compared with its creeping habit and paucity of foliage, give it a very remarkable and interesting aspect, and where the conditions are favourable to its growth, it is highly ornamental. It is quite hardy, but will not thrive in clay soils.

201. POLYGONUM.

POLYGONACEÆ—OCTANDRIA TRIGYNIA.

1. *Polygonum* VACCINIIFOLIUM. — North India, 1845. Trailing shrub. Leaves linear-lanceolate, small. Flowers in erect racemes, pinkish, numerous, showy. The creeping stems, taking root at intervals, spread over large surfaces, and render this pretty plant very eligible for rock-work. There are many species to this genus, but this is the only hardy one that can be included amongst ligneous plants, the remainder being herbaceous. So far our frosts do not appear to have injured it, but it has probably not yet been tried much higher than the latitude of London.

202. POPULUS—(*Poplar*).

SALICACEÆ—DICECIA OCTANDRIA.

1. *Populus* ACERIFOLIA.—England. Tree 80 feet. Probably a variety of the *P. alba*, from which it differs chiefly in

its broader and more deeply-lobed leaves and more elegant appearance. It displays in a still more marked manner the contrast of colour afforded by the wind-waved foliage described in the case of the *P. alba*.

2. *Populus ALBA*.—England. Tree 80-90 feet. Leaves angular, 3-lobed, smooth above, with thick white down beneath. Branches white and downy when young. One of the most rapid-growing of trees. The male catkins (3 inches long) appear early in April, the female (rather shorter) a week later. The seeds are enclosed in a cottony covering. Nothing can be more beautiful than the play of colour which the leaves exhibit when strongly agitated by the wind. The snow-white under-surface is brought to view, and contrasts strikingly with the green of the surrounding foliage. It is frequently called the Abele tree.

3. *Populus ANGULATA*.—Virginia, 1738. Tree 80 feet. Buds green, and not resinous. Bark of the shoots angled, and winged. Leaves ovate, deltoid, acuminate, toothed, much larger on young plants than on old. Branches brittle, and impatient of high winds. The angular appearance of the one and two year shoots is very remarkable and distinctive, and, together with the great length of the female catkins, gives a peculiar interest to this species.

4. *Populus BALSAMIFERA*.—N. America, 1692. Tree 80 feet. Buds very gummy. Petiole round, not compressed. Leaves ovate-lanceolate, serrated, white and somewhat tomentose on the under surface. Catkins long. It is distinguished by the fine tender yellow of the leaves when first developed, by the glutinous balsam which covers the buds, and which is strongly scented, and by the fastigate habit of the tree, which approaches somewhat to that of the *P. fastigiata*. The leaves expand very early, and are consequently exposed to occasional injury from spring frosts.

5. *Populus CANDICANS* (Ontario Poplar).—N. America, 1772. Tree 40-50 feet. Leaves heart-shaped, acuminate, serrated, large, deep green above, whitish beneath, expanding later than, but of the same yellow colour when young as, the *P. balsamifera*, and having also the same balsamic odour. A fine tree, but its beauty is somewhat marred by the irregularity with which its branches are disposed.

6. *Populus FASTIGIATA* (or *DILATATA*) (Lombardy Poplar).—Italy, 1758. Tree 120-140 feet. Leaves very similar to those of the *P. nigra*, but very distinct in its fastigiate, cypress-like form of growth. The tall, adpressed, columnar-shape of this tree forms a striking feature in our landscapes—where it is sparingly used; but on the Continent, where it forms immensely long avenues, bordering intolerably straight roads, it becomes wearisome and monotonous in the extreme.

7. *Populus GRÆCA* (Athenian Poplar).—1779. Tree 40-50 feet. Leaves roundish-cordate, acutely pointed and serrated. Catkins numerous, of a darkish colour, and (as well as the foliage) very elegant. It is still a moot-point whether it is a native of the Grecian Archipelago or of North America. By most it is thought that its epithet of Athenian is derived not from the Grecian city, but from a small township of the same name in North America.

8. *Populus MONILIFERA*.—Canada, 1772. Tree 100-120 feet. Leaves deltoid, tip acute, serrated, and at the acute tip the teeth have incurved points. Catkins long, numerous, and the shape of the female ones has given the tree its specific name of Necklace-bearing Poplar. The cottony seed is so abundant as to cover the ground beneath like a fall of snow. This is perhaps the most rapidly-growing tree cultivable in this country. It has been known to attain a height of 40 feet in seven years, and as the timber is of good quality, no tree affords a quicker return to the planter.

9. *Populus NIGRA*.—England. Tree 50-60 feet. Leaves deltoid, pointed, serrated, with glandular teeth, smooth. Catkins lax, cylindrical, numerous. The bark is ash-coloured, whence its specific name. The variety *N. viridis* is distinguished by its leaves being of a brighter green. The leaves of the *P. nigra* expand late (about the 15th May), and have at first a deep red tint mingled with the green. It is of rapid growth, and affords very useful timber.

10. *Populus TREMULA* (Aspen).—England. Tree 60-80 feet. Leaves nearly orbicular, toothed in a repand manner on long footstalks, which are compressed vertically; whence their rapid quivering with the slightest breeze. The catkins appear in March. From the incessant motion of the leaves, its umbrage has a peculiar effect.

“Variable as the shade
By the light quiv’ring aspen made.”

203. POTENTILLA.

ROSACEÆ—ICOSANDRIA POLYGYNIA.

1. *Potentilla FRUTICOSA*.—England. Small shrub 1-2 feet. Leaves pinnate, villose. Flowers yellow, solitary, numerous. A pretty plant, flowering through a great part of the summer, and the only ligneous species of a large genus prolific in beauties. It is perfectly hardy.

204. PRINOS—(*Winter Berry*).

AQUIFOLIACEÆ—HEXANDRIA MONOGYNIA.

1. *Prinos GLABER*.—N. America, 1759. Evergreen shrub 4 feet. Leaves lanceolate, glossy, somewhat coriaceous. Flowers small. Berries black. A compact, well-shaped evergreen shrub, densely clothed with foliage. It, how-

ever, is impatient of transplantation, and requires shelter from stormy winds. There are several deciduous species of Prinos, but none rival in elegance the evergreen species here described. It does not appear affected by our frosts, and is probably quite hardy.

205. PRUNUS—(*Plum*).

ROSACEÆ—ICOSANDRIA MONOGYNIA.

1. *Prunus* SINENSIS—FL. PLENO (or *AMYGDALUS PUMILA*).—China, 1683. Shrub 6-7 feet. Leaves ovate, acuminate, minutely serrated. Flowers very abundant, of a pure white, or, in some varieties, rose-coloured, both very double. A very ornamental shrub when clothed with its pretty blossoms, which it produces in abundance rather early in spring. Hardy in the climate of London.

2. *Prunus* TRILOBA.—China, 1846. Shrub 5-6 feet. Leaves ovate, slightly lobed, of a light green. Flowers very double, of a pale pink, and highly ornamental. It is only the double-flowering variety with which we are acquainted, and we can well afford to dispense with the other. Its claims to rank as a distinct species may fairly be doubted, but those it puts forward in respect to the profusion and beauty of its rosy blossoms can scarcely be denied. Within what range of latitude it will finally prove hardy is a question of interest to our countrymen of the north, which must be solved by actual experiment. By some botanists it is called *Amygdalopsis Lindleyi*.

206. PSEUDOLARIX—(*Golden Larch*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Pseudolarix* KEMPFERI.—China, 1852. Deciduous tree 60 feet. Leaves single on the leading shoots, but in bundles

on the branches, linear, about 2 inches long, of a tender light green when young, turning into a golden yellow before falling in autumn. Cones pendulous, 3 inches long, with deciduous scales, falling asunder when mature under the least pressure. A beautiful, curious, and valuable tree, too lately introduced to be known and appreciated as it deserves. If the expectations formed of it are realised, it will become a general favourite. Its foliage is particularly handsome, and it now remains to be ascertained whether, and to what extent, it is hardy with us. It is sometimes improperly called *Abies Kämpferi*.

207. PTELEA—(*Shrubby Trefoil*).

XANTHOXYLACEÆ—MONŒCIA TETRANDRIA.

1. *Ptelea* TRIFOLIATA.—N. America, 1704. Tree 20-40 feet. Flowers green, in corymbs. Fruit, flattened capsules. Leaves trifoliate, leaflets of a light green, and of an elegant shape. If trained to one stem, and in a favourable position, it grows into a rather tall tree; otherwise, it assumes a bushy growth, and is less handsome. Its graceful foliage constitutes its chief merit, but the flowers and succeeding capsules are interesting. There is no reason to suppose that it is not hardy throughout the range of our island.

208. PTEROCARYA.

JUGLANDACEÆ—MONŒCIA POLYANDRIA.

1. *Pterocarya* CAUCASICA.—Shores of the Caspian Sea, 1782. Tree 40 feet. Leaves large, pinnate; leaflets 17-19, unequal at the base, one side being attached to the petiole. Fruit resembling that of the Walnut, but winged. The noble foliage of this tree renders it worthy of general cultivation, but it requires care both in transplanting, as its roots

are coarse, and in training, as it has a tendency to grow as a bush, whereas its beauty is only fully developed when it is made to assume the tree-form. It does not seem susceptible of injury from our frosts, but it is greatly checked by removal, and it takes two or three years after being planted before it begins to grow freely, but once established, it makes luxuriant annual shoots.

209. PUNICA—(*Pomegranate*).

GRANATACEÆ—ICOSANDRIA MONOGYNIA.

1. *Punica* GRANATUM.—S. France, before 1548. Tree 18-20 feet. Leaves lanceolate, entire. Flowers scarlet, sessile, 3 or 4 together. It is rather tender, and thrives best when trained against a wall, in which position it produces its beautiful flowers freely, and in some seasons its fruit, which, however, never fully ripens in this climate except under glass. Its leaves, just before and whilst expanding, have a lovely deep scarlet tinge. It is not adapted for planting out in any place much north of London.

210. PYRUS—(*Pear*).

ROSACEÆ—ICOSANDRIA DI-PENTAGYNIA.

1. *Pyrus* ARBUTIFOLIA.—N. America, 1700. Shrub 4-6 feet. Leaves ovate-lanceolate, crenated, downy beneath. Flowers in bunches, white, very abundant. Berries dark red or purple. In autumn the foliage turns to a fine reddish-purple. When grafted on a standard the branches have a pendulous habit, and whether in that state, or as a bush, it fully deserves cultivation.

2. *Pyrus* ARIA (White Beam Tree).—England. Tree 30-40

feet. Leaves ovate, serrated, large, very downy and white beneath. Flowers white, in large corymbs, succeeded by scarlet berries, which are very ornamental in autumn. In still weather it exhibits green foliage, but when stirred by wind the white under-surface comes to view, affording an agreeable contrast. This much-neglected indigenous tree quite deserves a place in every plantation.

3. *Pyrus AUCUPARIA* (Mountain Ash).—England. Tree 30-35 feet. Leaves pinnate, leaflets serrated, smooth. Flowers white, in umbels. Berries bright scarlet, abundantly produced, and highly ornamental in autumn and throughout winter. No tree better stands rough winds, hence it is well adapted to exposed situations and to afford shelter to other trees, whilst its handsome flowers and berries enliven the landscape during both summer and winter.

4. *Pyrus SALICIFOLIA*.—Siberia, 1780. Tree 20-25 feet. Leaves linear-lanceolate, acute, very hoary. Flowers white, in short corymbs, abundant, but not very conspicuous on account of the almost similar colour of the leaves, which indeed constitute its chief merit, and render it well worthy of attention.

5. *Pyrus SPECTABILIS*.—China, 1775. Tree 25-30 feet. Leaves oval-oblong, smooth, serrated. Flowers in umbels, large, rose-coloured, very showy, expanding early in spring. Stamens and pistils remarkably numerous. The fruit is small and not eatable, but as a beautiful flowering tree it is unsurpassed.

6. *Pyrus TORMINALIS*.—England. Tree 40-50 feet. Leaves ovate, heart-shaped, large, acutely lobed. Flowers white, in terminal bunches. Fruit small, of a brownish colour, hanging in ornamental clusters throughout winter. Its fine foliage and luxuriant growth also combine to recommend it to notice.



QUERCUS ROBUR—Herne's Oak, Windsor Forest.

211. QUERCUS—(*Oak*).

CORYLACEÆ—MONŒCIA POLYANDRIA.

1. *Quercus* ALBA.—N. America, 1724. Tree 60-70 feet.
Leaves oblong, lobed, the indentations being more or less deep

in different individuals, rather pubescent underneath. Acorns large, oval, pedunculated. The bark is white and silvery, whence its specific name. It retains some of its withered leaves till spring, and is the only one of the American oaks that does so. In exposed situations its growth is slow, but it does not appear injured by our frosts.

2. *Quercus CERRIS* (Turkey Oak).—Levant, 1735. Tree 60-80 feet. Leaves oblong, deeply pinnatifid, hairy beneath. Cup of the acorn bristly. It is of rapid growth, with straight upright branches. A number of fine hybrids have been raised from the *Q. cerris*, of which the most beautiful is the *Q. C. Fulhamensis*. Its leaves are ovate-elliptic, dentated, large, and nearly evergreen. Both the species and its varieties are of rapid growth, ornamental, and very hardy. The buds are covered with linear stipules, which give them a very distinctive appearance in winter. Fine specimens are found in various places throughout Great Britain.

3. *Quercus COCCIFERA* (Kermes Oak).—S. Europe, 1680. Evergreen shrub 4-6 feet. Leaves small, oval, coriaceous, with bristly spinous teeth. It is interesting as being the food of an insect (*Coccus ilicis*) once extensively used as a dye of a rich blood-red colour. This has, however, been superseded by the Mexican cochineal, in which similar colouring-matter is much more abundant. As an ornamental shrub its chief merits are its pretty foliage and compact habit of growth. It is tolerably hardy in the climate of London, but may not resist the severer winters of our northern counties.

4. *Quercus ÆGILOPS* (Valonia Oak)—Greece, 1731. Tree 50-60 feet. Leaves ovate-oblong, with large and acute serratures, each point tipped with a sharp bristle, bright green, and downy at the back. Acorn large but short, in a large woody cup thickened by numerous lanceolate spreading scales. These cups are in great demand for tanning purposes, and many

cargoes of them are annually imported here from the Levant under the name of Valonia. The tree is a very fine one, and well worthy of cultivation. The downy leaves and large scaly cups are very remarkable and ornamental. It is scarcely so hardy as the *Q. cerris*, but it resists the cold of our southern and midland counties, whilst it has, perhaps, hardly had a fair trial north of the Trent.

5. *Quercus* FASTIGIATA.—S. France, 1820. Tree 40-50 feet. Leaves very similar to those of the common oak, from which, and from all other species, it is distinguished by its peculiar fastigate growth, and its resemblance in general shape to the Lombardy poplar. This singularity of form constitutes its chief claim to notice. It grows very freely, and rapidly becomes a distinct feature in a landscape. It is quite hardy in the climate of London, but it would be premature to say as much of it in our more northern districts, as it is indigenous to the valleys of the Pyrenees.

6. *Quercus* GLABRA.—Japan, 1850. Evergreen small tree or shrub 15-20 feet. Leaves large, ovate, acuminate, glabrous, resembling those of the common Laurel, but of a darker green. It has withstood, in the vicinity of London, several severe winters without injury, except by the weight of snow breaking some of the branches. Its magnificent foliage renders it a conspicuous and beautiful object in a shrubbery, but it is to be feared that it may not prove quite hardy, except in the south and west of England.

7. *Quercus* GRAMUNTIA.—S. France, 1730. Evergreen tree 30-40 feet. Leaves small, very downy beneath, roundish, undulated, with deep spinous teeth, something like those of the holly, but diminutive. It is chiefly remarkable for its acorns, which are edible, and resemble in taste the chestnut. There are extensive forests of this tree in Spain, in which large herds of swine are fed. It grows on the slopes of lofty moun-

tains, regions of snow and low temperatures, and is therefore quite hardy.

8. *Quercus* HETEROPHYLLA.—N. America, 1840. Tree 30-40 feet. Leaves on long footstalks, ovate-lanceolate, entire or irregularly toothed, of a fine green colour, glossy, and somewhat coriaceous. A very elegant and ornamental species, which is nearly evergreen, and almost if not quite hardy. Its fine foliage entitles it to a place in every collection. It would not be safe to plant it out of doors much north of London. There is a fine specimen of this tree in Kew Garden.

9. *Quercus* ILEX.—S. Europe, 1548. Evergreen tree 40-60 feet. Leaves ovate, acute, coriaceous, hoary beneath, nearly entire, sometimes serrated or prickly. The well-known evergreen oak is a general favourite, and outlives both the smoky atmosphere of cities and the sea-breezes better than most evergreens, but it is tap-rooted, and with difficulty withstands transplantation. It has also a tendency to a shrubby growth, and requires careful pruning to train it into a tree. Its dense dark foliage gives it rather a sombre appearance. It is quite hardy throughout the range of the island.

10. *Quercus* ILICIFOLIA.—N. America, 1800. Shrub 6-12 feet. Leaves 3-5 lobed, bristle-pointed, dark green above, whitish beneath. Interesting from its dwarf habit, compactness, and density of ramification, which, when the shrub occurs in extensive patches, as it often does in America, render it very obstructive for so dwarf a tree. It is quite hardy.

11. *Quercus* LANATA.—Nepal, 1818. Tree 30-40 feet. Leaves ovate, serrated, upper surface glossy green, the under densely clothed with woolly pubescence. Unfortunately this very handsome species is somewhat tender, but it fully deserves the privilege of protection either by matting in winter, or by training against a south wall. Its curious woolly leaves give it a character quite distinct from all its congeners ; and

no one, who for the first time saw a tree of it (unless in fruit), would recognise it as an oak. It is only just hardy in the south of England, and could not be successfully cultivated in the open air north of London.

12. *Quercus* LANCEOLATA.—Mexico, 1850. Evergreen tree 30-50 feet. Leaves lanceolate, entire, rather leathery, of a beautiful purple colour when first expanding. This is a rather tender tree, the unripe shoots being killed by our winter frosts, but they are usually replaced the ensuing summer by others which are luxuriantly produced. A dry situation is best for this plant, as conducing to shorter and better-ripened wood. But it is not likely to survive the winters of our northern counties, and even in the south it may probably never exceed the dimensions of a large shrub.

13. *Quercus* NIGRA.—N. America, 1739. Tree 30-40 feet. Leaves wedge-shaped, dilated towards the summit like a pear, slightly 3-lobed, rusty beneath, dying off early of a blackish red, from which circumstance, and from the dark colour of its bark, it is called in America the Black Jack. The singular form and colour of the leaves, quite peculiar to this tree, give it a fair claim to notice. It is probably as hardy as the rest of the American Oaks, but seems more fastidious as to soil, and does not grow so freely.

14. *Quercus* PALUSTRIS.—N. America, 1800. Tree 80 feet. Leaves oblong, deeply sinuated, lobes acute, sharply toothed and bristle-pointed, smooth, and dying off in autumn of an orange red. The spreading drooping branches of this species, and its light elegant foliage render it exceedingly ornamental. The leaves are lobed into peculiarly graceful shapes, and pass through a variety of tints (all beautiful), from their earliest period of expansion to that of their fall in autumn. Few trees can vie with it for beauty of foliage. The remarks made as

to hardiness on the *Q. rubra* apply with great exactness to this species.



QUERCUS PEDUNCULATA.

15. *Quercus* PEDUNCULATA.—England. Tree 60-100 feet. Leaves sinuated, dilated upwards, smooth, sessile. Stalks of the fruit elongated. This noble tree is too well-known to need further description. Suffice to say succinctly, that it is one of the most long-lived, majestic, picturesque, and useful of known trees. And nowhere does it grow in such perfection as in England. There is a beautiful variety of it called the *Q. P. pectinata* (or *pinnata*) with deeply cut leaves, so different in foliage from all other kinds, and yet so graceful, light, and elegant, as amply to deserve cultivation as an ornamental tree.

16. *Quercus PHELLOS* (Willow Oak).—N. America, 1720. Tree 40-70 feet. Leaves lanceolate, smooth, entire, of a light green, very similar in shape to those of the Willow. It is one of the hardiest and most rapid-growing of the American Oaks, and there are some fine specimens in this country. The foliage, however, is rather sparse, and, while it expands late, it falls early. The disposition of the spray is peculiarly elegant.



QUERCUS PHELLOS.

17. *Quercus PRINUS*.—N. America, 1730. Tree 60-70 feet. Leaves large, obovate, regularly dentated with blunt teeth, rather whitish beneath, terminating in a point. Acorns large, oval. From the resemblance of the leaves to those of the Castanea, it is called the Chestnut Oak. It has been the parent of many varieties, all of them more or less resembling it in its main feature—viz. the chestnut-like form of the leaf. It is quite hardy in the climate of London, and will probably be found so even in somewhat higher latitudes.

18. *Quercus PYRENAICA*.—Pyrenees, 1822. Tree 15-20 feet. Leaves oblong, lobed, stalked, and remarkable for their reddish tinge and dense covering of woolly down on their first expansion, which, however, is late in spring. The tree then forms an object of great beauty, and this peculiarity entitles it to a place in our plantations. It is probably quite hardy.

19. *Quercus RUBRA* (the Champion Oak).—N. America, 1739. Tree 80-90 feet. Leaves large, oblong, on long stalks, more or less deeply sinuated or lobed, the lobes acute, toothed, bristle-pointed, dying off in autumn of a beautiful purplish red. The leaves, when they first expand, are of a fine sulphur colour, and on young trees are less cut than on the old ones. The Scarlet Oak (*Q. coccinea*) differs but slightly from this species, and is very probably only a variety of it. Both are remarkable for the great beauty of their foliage, being of an elegant glossy green in summer, and of a brilliant scarlet or purplish hue in autumn. Of the hardiness of these species there can be little doubt, since very fair specimens are found in Scotland. Should they be (as they ought) more freely interspersed in our plantations throughout the country, the diversity and beauty of our autumnal tints would receive a glorious accession.

20. *Quercus SESSILIFLORA*.—England. Tree 60-100 feet. Chiefly distinguished from the *Q. pedunculata* in its leaves being stalked and its fruit sessile, whereas it is precisely the converse in the *Q. pedunculata*. The two were formerly classed into one species under the name of *Q. robur*.

21. *Quercus SUBER* (the Cork Tree).—Spain, 1699. Evergreen tree 30-40 feet. Leaves ovate-oblong, coriaceous, entire or serrated, downy beneath. Very interesting from the extraordinary development of the cellular tissue of the outer bark, which forms the useful and well-known substance called cork. Its lightness, porosity, compressibility, and imperviousness to fluids, form a combination to which it would be difficult to find a counterpart. It is detached from trees (from the age of about twenty years) in pieces about a foot square, and 1 inch (or more) thick, and the operation is repeated every eight or ten years, by which time the corky substance is renewed, without detriment to the tree. It grows freely in England, and is at least as ornamental a tree as the evergreen oak, whilst its

economic properties impart to it a peculiar interest. It is quite hardy, at least south of the Trent, and probably in sheltered situations still farther north.

22. *Quercus VIRENS* (the Live Oak).—Virginia, 1739. Ever-green tree 40-50 feet. Leaves oval, coriaceous, nearly entire, downy beneath. Acorns oval, nearly black. This is a handsome tree, but it grows to a much less height here than in America, where its timber is as highly valued for naval purposes as our own indigenous oak is in this country. It is a pity that its development is checked under the influence of our climate, as both foliage and timber would be valuable acquisitions for beauty and utility. It is tolerably hardy near London, though by no means as luxuriant as in its native regions, and it probably would prove tender in the midland and northern counties.



G. V.

QUERCUS SESSILIFLORA.

212. RAPHIOLEPIS—(*Indian Hawthorn*).

ROSACEÆ—ICOSANDRIA 2-5-GYNIA.

1. *Raphiolepis* OVATA.—Japan, 1864. Evergreen shrub 8-10 feet. Leaves large, broadly obovate, coriaceous, of a dark glossy green. Flowers white, in terminal panicles, fragrant. Fruit a small pome, said to be edible. A splendid shrub of recent introduction, which has so far proved hardy, and of easy culture. Its leaves, flowers, fruit, and habit of growth, are all attractive. If it retains its place in our gardens without, or with little, protection, it will be one of the most valuable contributions we have as yet received from a country that has enriched our plantations beyond all others in proportion to its extent. It seems so little affected by our frosts in the climate of London, that it is not unlikely it may withstand the winters of our northern counties; at all events the experiment should be made.

213. RETINOSPORA.

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Retinospora* ERICOIDES.—Japan, 1845. Shrub 4-6 feet. Leaves chiefly in threes, linear, $\frac{1}{4}$ -inch long, tapering into a point. Branches numerous, very leafy, forming a handsome compact bush. The foliage acquires a pretty pinkish-brown colour during winter, but resumes its dark-green hue when the new growth is made; and as this is the only effect on the plant which our frosts have so far produced, it may be hoped that it may prove hardy even in the northern parts of our island.

2. *Retinospora* FILIFERA.—Japan, 1864. Shrub 8-10 feet. Leaves short, pointed, embracing the stem at their base, light green, with silvery dorsal lines. Young branchlets long, pendent. Too little is yet known of this plant to speak posi-

tively, but, if it prove hardy, its elegant habit and its consanguinity with some of the most charming plants with which prolific Japan has furnished us, seem to assign to it a high place in our favour. That it may prove hardy at least in the more favoured localities of our southern counties, there is every reason from analogy to expect.

3. *Retinospora* OBTUSA.—Japan, 1850. Tree 70-80 feet. Leaves chiefly in fours, scale-formed, closely adpressed, the lateral ones pointed and falcate. Branches dense, spreading out like a fan. Cones solitary, terminal, globular, scaly. If hardy, of which there is little doubt, it will prove a valuable acquisition, both for ornament and utility, as the timber is white, fine-grained, and durable. In the neighbourhood of London it has not received any injury from our frosts, and it indeed seems robust enough to stand the winters of our northern counties.

4. *Retinospora* PISIFERA.—Japan, 1852. Tree 20-30 feet. Leaves scale-formed, in four rows, the lateral ones compressed at the edges, falcate, acuminate, with two glaucous bands. Branches numerous, very leafy. Cones of the size of a pea, scaly. A very elegant and graceful tree, of which there are two charming varieties—the *P. aurea* and the *P. argentea*. In one, the variegation of the leaves is of golden, in the other of silvery hue, and they need only to be known to become general favourites. It is hoped and expected that these charming plants will prove hardy. Indeed, we learn from an interesting paper on Japanese Coniferæ, by Mr. R. Hutchison of Carlowrie, that at Falkirk, where *Cryptomerias* and *Cephalotaxus* suffer during winter, *R. pisifera* and its varieties had proved perfectly hardy. But from their present rate of growth and dense habit, it seems doubtful whether they will attain with us the size which it is said that they reach in their native country.

214. RHAMNUS—(*Buckthorn*).

RHAMNACEÆ—PENTANDRIA MONOGYNIA.

1. *Rhamnus* ALATERNUS.—S. Europe, 1629. Evergreen shrub 15-20 feet. Leaves ovate-elliptical, glossy, of a fine green, somewhat coriaceous. Flowers inconspicuous. A densely-branched evergreen, which bears the smoke of towns better than most plants, and ought to be more freely cultivated. It is quite hardy in the average climate of England, and tolerably so in the northern parts of the island, but during the prevalence there of severe frosts, a little protection from the N. and N.E. winds is necessary; and so ornamental an evergreen fully deserves the slight trouble which such precaution involves.

2. *Rhamnus* CATHARTICUS.—England. Shrub 12-15 feet. Leaves ovate, ribbed, dentated. Flowers yellowish-green. Berries bluish-black; violently purgative. It is well adapted to form hedges, and its abundant berries make it ornamental in autumn and winter.

3. *Rhamnus* FRANGULA.—England. Shrub 8-10 feet. Leaves oval, smooth, marked with ten lateral nerves. Flowers whitish, small. Berries dark purple. Bees are very fond of the flowers, and good dyes are extracted from both the berries and the bark. It has been lately ascertained that the wood is peculiarly well adapted to the manufacture of gunpowder. There are several other species botanically different, but they are so near in general resemblance to one or other of those above described, that they cannot be recommended for cultivation.

215. RHODODENDRON (*Rose Bay*).

ERICACEÆ—PENTA-DECANDRIA MONOGYNIA.

1. *Rhododendron* ARBOREUM (var. NIVEUM).—Nepal, 1817.

Evergreen arborescent shrub 20 feet. Leaves lanceolate, acute, silvery beneath. Flowers large, produced early in spring, in dense heads or trusses, snowy white, bell-shaped, yielding honey so copiously as to drop out when the plant is shaken. This beautiful species is slightly tender, and requires a somewhat sheltered situation. How far north of London it would stand out is doubtful.

2. *Rhododendron* CAMPANULATUM.—Nepal, 1825. Evergreen shrub 4-6 feet. Leaves elliptic, pointed, rusty beneath, with a fine scaly pubescence on the upper surface. Flowers very large, in corymbose clusters, pale pink with purple spots. Nearly hardy.

3. *Rhododendron* CATAWBIENSE.—Virginia, 1809. Evergreen shrub 5-6 feet. Leaves oval, coriaceous, green above, paler beneath. Flowers in corymbs, purple. From hybridization between this species, the *R. ponticum*, *maximum*, *campanulatum*, *arboreum*, and several others, has sprung that almost innumerable progeny of garden varieties which form such conspicuous ornaments to our shrubberies. It is not within the scope of this work to embrace other than natural species;—indeed, it would be an endless task to attempt to describe or classify the beautiful but comparatively ephemeral forms which have sprung out of the ingenious devices of scientific horticulture. By the intelligent application of general laws—that is, by cross-fecundation, and by the stimulus of artificial cultivation in its many forms—the *Rhododendron*, *Azalea*, *Rose*, *Dahlia*, *Pansy*, etc. etc., have yielded flowers, and the *Apple*, *Pear*, *Peach*, etc. etc., have yielded fruit, not only of amazing diversity, but also greatly surpassing in size, vividness of colour, and delicacy of flavour, the produce of the natural species to which the varieties owed their origin.

4. *Rhododendron* CHAMÆCISTUS.—Austria, 1786. Small evergreen shrub under 1 foot. Leaves lanceolate, ciliated, small. Flowers pale purple, wheel-shaped, large as compared with

the leaves. It is the most diminutive form of the genus. Probably not hardy in North Britain.

5. *Rhododendron* CILIATUM.—Himalayas, 1850. Evergreen shrub 2 feet. Leaves elliptic, acuminate; margins ciliated, with short stiff hair, rusty beneath. Flowers large, pale rose, in clusters, abundantly produced in early spring. This charming plant is the hardiest of those numerous species which have, since Dr. Hooker's visit to the Himalayas, been introduced from the mountainous districts of Sikkim and Bhotan. They are all beautiful, and several are surpassingly lovely both for their gorgeous flowers and their splendid foliage. Unfortunately, although some of them will live and grow in the open air in our climate, the *R. ciliatum* is the only species which blossoms freely without being under glass. Those who might be inclined to make the experiment might try the following:—*R. Thompsoni*, *Wightii*, *argenteum*, *campylocarpum*, and *Dalhousianum*. Whether the *R. ciliatum* is sufficiently robust to thrive and flower much north of London, has still to be tested by actual experiment.

6. *Rhododendron* DAURICUM.—Siberia, 1780. Shrub 5-7 feet. Leaves small, oblong, sprinkled beneath with rusty scales. Flowers rather small, purple, chiefly remarkable from their being produced in winter (from December to March). It is a conspicuous member of the very small and valuable group of winter-flowering shrubs.

7. *Rhododendron* FERRUGINEUM.—Alps, 1752. Evergreen shrub 1 foot. Leaves oblong, of a shining green above, stellately dotted beneath. Flowers in corymbs, rose-coloured, funnel-shaped. It grows in profusion in the Alps, where it is called the Alpine Rose.

8. *Rhododendron* PONTICUM.—Armenia, 1763. Evergreen shrub 10-12 feet. Leaves oblong-lanceolate, coriaceous, shining green above, rather rusty beneath. Flowers in short

corymbose racemes, large, purplish pink. This is the most common of all the species, and usually forms the stock on which the hybrid varieties are grafted. It is a plant of great beauty, but its merits are so eclipsed by the superior charms of other species and their numerous varieties, that it is treated with comparative neglect.

216. RHODORA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Rhodora* CANADENSIS.—Canada, 1767. Shrub 2-3 feet. Leaves oval, green above, downy and glaucous beneath. Flowers small, pale purple, in terminal clusters, expanding early in spring. It requires peat-soil in order to thrive, but at best has nothing but its pretty flowers to recommend it, as its habit of growth is inelegant.

217. RHUS—(*Sumach*).

ANACARDIACEÆ—PENTANDRIA TRIGYNIA.

1. *Rhus* COPALLINA.—N. America, 1697. Shrub 6 feet. Leaves and other characters very similar to those of *R. typhina*, but the plant is much smaller in all its parts, and possesses peculiar neatness and elegance. The leaves are used as tobacco by the Indians.

2. *Rhus* COTINUS.—S. Europe, 1656. Shrub 10-20 feet. Leaves obovate, smooth, stiff, on long footstalks, persistent until strong frosts. Flowers small, in large panicles, many abortive, but their pedicels become elongated and hairy, giving the shrub a very remarkable appearance, and forming its chief claim to notice. The leaves assume a reddish tint in autumn.

3. *Rhus* TYPHINA.—N. America, 1629. Tree 20 feet. Leaves pinnate, leaflets 15-17, lanceolate, pointed, serrated, hairy beneath, changing in autumn to a yellowish-red.

Flowers individually small, in conspicuous terminal spikes. Young shoots covered with velvety down. An ornamental but rather short-lived species, well known as the Sumach Tree.

There are two other ornamental species of *Rhus*, viz. the *R. venenata* and *radicans*, but their juices are so poisonous, that contact with them is best avoided, and hence they are omitted in this work.

218. RIBES—(*Currant*).

GROSSULACEÆ—PENTANDRIA MONOGYNIA.

1. *Ribes* AUREUM.—N.W. America, 1812. Shrub 8-10 feet. Leaves 3-lobed, smooth. Flowers yellow, in small racemes, calyx long, tubular. Fruit yellow, and of a good flavour. One of the most ornamental of a genus which is usually more distinguished for its utility than for its beauty.

2. *Ribes* RUBRUM MULTIFLORUM.—Croatia, 1822. Shrub 6-8 feet. Leaves 5-lobed, cordate, tomentose beneath. Flowers green, in long pendulous racemes. This is a variety of the common red currant, but differs from it by its production of more ornamental flowers and leaves, but of little or no fruit.

3. *Ribes* SANGUINEUM.—N.W. America, 1826. Shrub 8-10 feet. Leaves slightly 5-lobed, cordate, serrated, downy beneath. Flowers produced early and abundantly in large racemes, of a deep rose colour. The double-flowered variety is peculiarly showy and ornamental, and is well deserving of general cultivation.

4. *Ribes* SPECIOSUM.—California, 1829. Shrub 8-10 feet. Leaves slightly 3-lobed, crenate, shiny. Flowers deep red, stamens much longer than the petals, filaments red. They bear some resemblance to those of the Fuchsia, whence it was at first called *R. fuchsoides*. The leaves are very persistent, and nearly sub-evergreen.

219. ROBINIA—(*Locust Tree*).

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Robinia* HISPIDA.—Carolina, 1758. Small tree 10-15 feet. Leaves pinnate, leaflets obovate, larger than those of the *R. pseudacacia*, mucronate. Flowers in pendulous racemes, large, rose-coloured, and highly ornamental. The branches are very hispid and armed with prickles, but so brittle that they require some support, or at all events a very sheltered situation. This elegant shrub is generally grafted on the *R. pseudacacia*, on which it grows luxuriantly. Both the flowers and foliage are so beautiful that they fully deserve the shelter of a wall or espalier. It is from the mechanical violence of the wind that the plant suffers, for, as regards frost, it appears sufficiently hardy.

2. *Robinia* PSEUDACACIA (the Common Acacia).—N. America, 1640. Tree 50-60 feet. Leaves pinnate, leaflets 9-13, very smooth, with strong uncinated prickles in the place of stipules. Flowers in pendulous racemes, white, fragrant, succeeded by 5-6-seeded legumes. A tree of very rapid growth, but not very long-lived, and the branches, being very brittle, are liable to mutilation from the wind. Of the varieties, which are numerous, the following are the most interesting:—

P. stricta.—Of fastigiate growth, similar to that of the Lombardy poplar.

P. tortuosa.—Branches numerous and contorted; leaves twisted and curled, densely clothing the shoots.

P. umbraculifera.—Leaves without spines; head rounded, and not bearing flowers in this country.

It is commonly misnamed Acacia, a denomination belonging to quite a distinct genus.

3. *Robinia* VISCOSA.—S. Carolina, 1797. Tree 40 feet. Leaves very similar to those of the *R. pseudacacia*. Flowers pale pink and scentless. Branches viscid and clammy. It flowers abundantly.

220. ROSA—(*Rose*).

ROSACEÆ—ICOSANDRIA POLYGYNIA.

(In this work only such species as are botanically distinct are admissible. As in the case of Rhododendrons, Azaleas, etc., the innumerable host of hybrids and garden varieties are excluded.)

1. *Rosa* BANKSIÆ.—China, 1807. A climbing shrub, bearing very numerous and very double, though small, flowers in corymbs, of which the fragrance is exquisite. It appears to be quite hardy in the climate of London, and tolerably so even farther north.

2. *Rosa* FEROX.—S. Russia, 1796. Shrub 3-4 feet. Chiefly remarkable for its numerous prickles, which are crowded together all over the branches. The flowers are red, and of a large size.

3. *Rosa* RUBIGINOSA.—England. Shrub 5-6 feet. Well known as the sweet briar or eglantine; and its numerous pink flowers and scarlet berries, as well as its fragrant leaves and compact form, justify the popularity which it enjoys.

4. *Rosa* SULPHUREA.—Levant, 1620. Shrub 4-10 feet. Flowers large, of a fine yellow colour. It is rather shy of flowering, and succeeds best when trained against a wall. But the colour and size of the flowers make it a most desirable acquisition, and entitle it to all the protection it may require, especially in the ruder climate of North Britain.

221. RUBUS—(*Bramble*).

ROSACEÆ—ICOSANDRIA POLYGYNIA.

1. *Rubus* LACINIATUS.—(Supposed to be a variety of the

common bramble, *R. fruticosus*.) A trailing shrub. Leaves digitate, leaflets pinnately cut and toothed. It is in this character only that it differs from the common bramble, but it is quite sufficient to give it a very distinct and elegant aspect, and it would be difficult to recognise its affinity but for the flowers and fruit.

2. *Rubus* NUTKANUS.—N.W. America, 1826. Shrub 5-6 feet. Leaves large, five-lobed, unequally toothed. Flowers large, few in a corymb, white, succeeded by plump red berries. This plant is adapted to woods or waste places, which it is intended to cover, as its creeping roots throw up numerous stems all round it; so much so, that in a garden it becomes a weed and a nuisance, notwithstanding its striking foliage and fine flowers.

3. *Rubus* SPECTABILIS.—N. America, 1827. Shrub 4-5 feet. Leaves of three leaflets, serrated, downy beneath. Flowers solitary, purplish, fragrant. Fruit dark yellow, large, acid. The branches are round, smooth, and free from prickles. A very charming little shrub, densely clothed with foliage, of a compact shape, and bearing handsome and scented flowers. It appears to be quite hardy.

222. RUSCUS—(*Butcher's Broom*).

LILIACEÆ—DICECIA TRIANDRIA.

1. *Ruscus* HYPOGLOSSUM.—Italy, 1596. A low evergreen plant 6-12 inches high. Leaves 3 inches long, pointed, with a small leaf or bract of similar shape coming out of the middle of the upper surface, from under which and from the point of junction emerges the flower, of a pale yellow, on a peduncle, succeeded by a red berry. Its peculiar mode of inflorescence renders it an interesting plant.

2. *Ruscus RACEMOSUS* (Alexandrian Laurel).—Portugal, 1739. Small evergreen shrub 4 feet. Leaves persistent, oblong, acuminate, 2 inches long, of a glossy green colour, wavy. Flowers in terminal bunches, greenish-yellow. Berries red. Well deserving attention on account of its beautiful leaves and graceful habit of growth. It is of doubtful hardiness in the northern parts of our island.

223. RUTA—(*Rue*).

RUTACEÆ—OCTANDRIA MONOGYNIA.

1. *Ruta GRAVEOLENS*.—S. Europe, date of introduction uncertain. Evergreen shrub 6-8 feet. Leaves bipinnate, hoary, powerfully scented; flowers yellow, produced several months in succession. It is usually grown in the kitchen-garden, but when cultivated as an ornamental shrub, it has a very handsome appearance. To this end, it should be trained to a single stem.

224. SALISBURIA—(*Gingko*).

TAXACEÆ—MONECIA POLYANDRIA.

1. *Salisburia ADIANTIFOLIA*.—China, 1750. Tree 60-80 feet. Leaves very distinct from those of all other trees, being wedge-shaped at the base, abrupt at the upper extremity, and the margin notched and somewhat thickened, which peculiarities give them some resemblance to the spore-bearing fronds of the maiden-hair fern. Fruit ovate, drupaceous, on long footstalks, eatable. It is a fine tree of rapid growth, very hardy, remarkable for the singularity and beauty of its leaves, and in all respects worthy of general cultivation. There is a fine specimen of this tree in Kew Gardens.

225. SALIX—(*Willow*).

SALICACEÆ—DICECIA DIANDRIA.

1. *Salix ACUTIFOLIA*.—Podolia, 1808. Tree 15-20 feet. Branches upright, of a dark violet colour, covered with a whitish powder like the bloom on a plum. Leaves linear-lanceolate, acuminate, and smooth. A handsome species.

2. *Salix ALBA* (Common White Willow).—England. Tree 80 feet. Leaves elliptic, silky on both sides. One of the quickest-growing of known trees, and, although common, very ornamental when trained to a good shape, especially after it has attained a large size. The silkiness of its leaves produces a fine effect when contrasted with those of other trees.

3. *Salix BABYLONICA* (Weeping Willow).—Asia, 1730. Tree 50-60 feet. Branches pendulous. Leaves lanceolate. The graceful habit of this well-known tree has rendered it a general favourite. It is of rapid and vigorous growth, especially when near water, with which it has a decided affinity. The early expansion of its leaves subjects them to temporary injury from cold winds, but they are replaced by others when mild weather sets in.

4. *Salix CANDIDA*.—N. America, 1811. Tree 10-20 feet. Leaves linear-lanceolate, 3-4 inches long, downy above, white and cottony beneath, which peculiarity gives the plant a distinctive feature, and, with its very early flowers, renders it very attractive.

5. *Salix CAPREA* (Goat Willow).—England. Tree 30-40 feet. Leaves roundish ovate, pale and downy beneath. Flowers yellow, handsome, appearing before the leaves. There is a blotched-leaved variety called the *C. tricolor*, which presents an uncommon aspect and is well worthy of cultivation.

6. *Salix HELIX* (Rose Willow).—England. Tree 10-12

feet. Branches upright, of a yellow colour. It derives its English name from the ends of the twigs being frequently expanded by the operation of a species of cynips into numerous petal-like leaves, which assume the appearance of green roses. The leaves are glaucous and have a peculiar twist.

7. *Salix* HERBACEA.—England. One of the smallest of known ligneous shrubs, 2 or 3 inches high, with prostrate twigs; indeed it derives its chief interest from its diminutive size, and this singularity entitles it to a place in collections. Leaves orbicular, veiny, shining.

8. *Salix* LANATA.—Lapland, and found in one or two places in Scotland. Shrub 3-4 feet. Leaves roundish, $1\frac{1}{2}$ -2 inches long, covered with long silky shaggy hairs. Flowers large, bright yellow, contrasting beautifully with the silvery leaves. Its exceptional aspect strikes every beholder, and renders it an object of special interest. It requires some care in cultivation, as it does not brook the interference of other plants.

9. *Salix* PENTANDRA.—England. Tree 20 feet. Branches upright, smooth, shining. Leaves large, of a rich deep green, and glossy. The flowers are later in expanding than in most other species, remarkably fragrant, and very showy. Its inflorescence constitutes its chief merit.

10. *Salix* PURPUREA.—England. Small tree or bush 8-10 feet, with decumbent branches. It is chiefly remarkable for the rich purple colour (covered by a bloom like that on a plum) of its branches, which, with its elegant slender twigs and red catkins, renders it very ornamental.

11. *Salix* RUSSELLIANA.—England. Tree 80-90 feet. Leaves lanceolate, smooth. Branches long, straight, and slender. The majestic height which it attains, and the elegance of its appearance, render it valuable in a plantation, independently of its great merits as a timber tree.

226. SAMBUCUS—(*Elder*).

CAPRIFOLIACÆ—PENTANDRIA TRIGYNIA.

1. *Sambucus* RACEMOSA.—S. Europe, 1596. Shrub 12-15 feet. Leaves pinnate; leaflets 5, acuminate, serrated. Flowers in panicles, whitish green. Fruit scarlet, large, abundant, and very ornamental. This species is the only one deserving a place in the shrubbery, as the common Elder (and even the variety with blotched leaves) is coarse in its foliage and inelegant in its habit.

227. SANTOLINA—(*Lavender Cotton*).

COMPOSITÆ—SYNGENESIA ÆQUALIS.

1. *Santolina* CHAMÆCYPARISSUS.—S. France, 1573. Evergreen shrub 2-3 feet. Leaves linear, toothed, very hoary. Flowers of a bright yellow, in heads, on long peduncles; involucre downy. The contrast between the yellow flowers and the white leaves is very striking, and it is a pretty and interesting shrub. It is quite hardy throughout England and Ireland, and very probably may brave even the Scottish winters.

228. SCIADOPYTIS—(*Umbrella Pine*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Sciadopytis* VERTICILLATA.—Japan, 1855. Tree 100-120 feet. Leaves linear, 2-2½ inches long, tapering to a point, ribbed on the under side, in close tufts of 30 to 40 on the ends of the shoots, forming a whorl somewhat in the shape of an inverted parasol. Shoots without leaves except at the top, but with scales which, when they fall, leave scars behind. Cones elliptic,



SCIADOPYTIS VERTICILLATA.

2½ inches long, scaly. A curious and beautiful tree, of a pyramidal shape, with horizontal spreading branches, which is rather rare even in its native country, and which, if hardy, will prove a valuable addition to our gardens. No specimen exists here as yet of a sufficient size to decide the question of acclimatisation, even in the south of England.

229. SEQUOIA—(*Red Wood*).

CONIFERÆ—MONOCIA MONADELPHIA.

1. *Sequoia* SEMPERVIRENS.—California, 1843. Tree 200-250 feet. Leaves linear, ½-1 inch long, blunt, two-rowed, flat, of a shining dark green. Branches spreading, the smaller ones sometimes drooping. Cones solitary, terminal, egg-shaped, 1 inch long. A gigantic tree, of inelegant appearance for the first few years of its existence, but which, when the trunk and leading shoot have once been fully developed, assumes a noble shape and imposing aspect. Possibly a century hence it may prove one of the greatest ornaments of our landscapes. Within what range of temperature it may thrive in our island has still to be ascertained, but it is certainly hardy even in our midland counties.

230. SERISSA.

RUBIACEÆ—PENTANDRIA MONOGYNIA.

1. *Serissa* FETIDA (FOL. VARIEGATIS).—China, 1787. Shrub 2-3 feet. Leaves evergreen, ovate-lanceolate, small. Flowers axillary, white, bell-shaped. A pretty little shrub, and nearly hardy. The leaves when bruised exhale a disagreeable odour, but their very decided and permanent variegation makes it a striking ornament to our *parterres*. It is

quite hardy in the latitude of London, although for many years it was treated as a greenhouse plant. It does not produce its flowers freely.

231. SHEPHERDIA.

ELÆAGNACEÆ—DICECIA OCTANDRIA.

1. *Shepherdia* ARGENTEA.—N. America, 1818. Tree (or shrub) 15-20 feet. Leaves covered with silvery scales, which give to the tree a very remarkable appearance. Flowers small. Berries scarlet, abundant, and edible. The silver-grey tint of the foliage forms a striking feature in the shrubbery, and attracts immediate notice from the spectator. The tree is of slow growth, but quite hardy, and is highly deserving of notice.

232. SKIMMIA.

AQUIFOLIACEÆ—TETRANDRIA MONOGYNIA.

1. *Skimmia* JAPONICA.—Japan, 1848. Evergreen shrub 3-5 feet. Leaves lanceolate, entire, leathery, with small transparent dots. Flowers in panicles, whitish, very fragrant. Berries comparatively large, bright red, very showy. A charming shrub, of which the leaves, flowers, and berries have each their peculiar claims to admiration. In the south of England it appears so tolerant of our winter frosts, that it is not unreasonable to expect that it may bear the sharper climate of our most northern counties. The variety cultivated in England has its leaves margined with a white line.

2. *Skimmia* LAUREOLA.—Nepal, 1854. Evergreen shrub 4-6 feet. Leaves large, oblong-lanceolate, acute, entire, smooth, dark green above. Flowers pale yellow, in dense terminal

racemes, very fragrant. It has hitherto proved quite hardy in the climate of London, and, though not of quick growth, keeps well clothed with its beautiful smooth evergreen leaves.

3. *Skimmia* OBLATA.—Japan, 1864. Evergreen shrub 6-8 feet. Leaves large, ovate-lanceolate, entire, glossy green above, paler beneath, with small glandular dots. Flowers whitish, in terminal racemes. A very handsome evergreen, which bids fair to prove hardy, at least in the south of England. The leaves grow close together towards the end of the shoots, which gives them a verticillate appearance. The berries are of oblate form (whence the specific name), scarlet, and very ornamental.

233. SMILAX.

SMILACEÆ—DICECIA HEXANDRIA.

1. *Smilax* ROTUNDIFOLIA.—Canada, 1760. Climbing sub-evergreen shrub. Leaves elliptic, 3-nerved, smooth, and coriaceous. Stem round, prickly. Flowers in umbels, inconspicuous; berries black. It exhibits no sensitiveness to our severest frosts in the vicinity of London, and it will probably prove hardy even in most parts of Scotland.

2. *Smilax* SARSAPARILLA.—N. America, 1664. Climbing shrub, evergreen. Leaves ovate, pointed, of a beautiful glossy green, with tendrils at the base. Stems long and slender, prickly. Flowers small, whitish. It used to be employed medicinally, but is now comparatively neglected. It forms a good cover to a wall or to the stump of a tree, or to trellis-work, as it grows very rapidly, and throws out a thick canopy of its beautiful leaves.

234. SOLANUM—(*Nightshade*).

SOLANACEÆ—PENTANDRIA MONOGYNIA.

1. *Solanum* JASMINOIDES.—S. America, 1838. Climbing shrub of rapid growth. Leaves mostly cordate, ovate, entire, but sometimes 2-3-4 cleft, of a light green. Flowers very abundant and showy, in panicles, of a pinkish white. This handsome climber is found to be wonderfully hardy, considering that it is indigenous to a warm climate. Like most of the *Solanums*, its flowers are much handsomer than its foliage. It will not be safe to attempt its out-door culture much north of London, until experience shall have fixed the limit of its hardiness.

235. SOPHORA.

LEGUMINOSÆ—DECANDRIA MONOGYNIA.

1. *Sophora* JAPONICA.—Japan, 1763. Tree 70-80 feet. Leaves pinnate, leaflets 11-13, ovate, smooth, acute. Flowers cream-coloured, in large terminal bunches, but not produced on young plants. This tree is very hardy, of moderately rapid growth, and very ornamental. When grafted on a standard, so as to assume a pendulous habit, it produces a most charming effect. It does not flower very freely, especially when exposed to rougher climatic influences than those of our southern counties.

236. SPARTIUM—(*Spanish Broom*).

LEGUMINOSÆ—MONADELPHIA DECANDRIA.

1. *Spartium* JUNCEUM.—Spain, 1548. Shrub 14-18 feet. Leaves few, small, fugacious. Stems upright, round, smooth,

of a deep green. Flowers yellow, terminal, large, but not abundant. The rush-like shoots are rich in fibre, and are used in South Europe as a substitute for flax and hemp. These numerous deep-green shoots give it in winter the appearance of an evergreen. It is very hardy in the climate of London, but may probably prove more sensitive under the influence of a severer temperature.

237. SPIRÆA.

ROSACEÆ—ICOSANDRIA PENTAGYNIA.

1. *Spiræa* ARLEFOLIA.—N.W. America, 1827. Shrub 8-10 feet. Leaves oblong, toothed, somewhat lobed, villous beneath. Flowers white, in large upright panicles, very abundant and ornamental, but the shrub is rather rambling in its mode of growth, pushing up numerous suckers from the roots. This defect is redeemed by its copious inflorescence.

2. *Spiræa* BELLA.—Nepal, 1820. Shrub 3-4 feet. Leaves ovate, pointed, serrated. Flowers in small corymbs, rose-coloured, very pretty. A very desirable shrub, both from its delicate light green foliage and its elegant rose-pink blossoms.

3. *Spiræa* CALLOSA.—Japan, 1845. Shrub 6-8 feet. Leaves ovate-lanceolate, irregularly cut and toothed. Flowers in corymbs, of a showy red. The general appearance of this shrub is quite distinct from that of most other species. It was a great favourite with the late Dr. Lindley, who attracted attention to it by calling it (with rather hyperbolic praise) "the finest of all July-flowering shrubs."

4. *Spiræa* CHAMÆDRIFOLIA.—Siberia, 1789. Shrub 6 feet. Leaves ovate, glabrous, cut or toothed at the tip. Flowers white, in large corymbs, abundant and showy.

5. *Spiræa* LÆVIGATA.—Siberia, 1774. Shrub 3-4 feet. Leaves obovate, quite smooth, entire, rather thick and glaucous. Flowers white, in a short panicle. Habit very distinct from the other species, and although not remarkable for beauty of blossom, its peculiarity of foliage makes it worth cultivation.

6. *Spiræa* LINDLEYANA.—Himalayas, 1845. Shrub 10-12 feet. Leaves pinnate, very large, leaflets numerous, dentate. Flowers white, in large drooping panicles, abundant and ornamental, as is the pinkish fruit, which hangs for a long time. The stems are apt to die down, and are in such case replaced by vigorous shoots from the roots. It shows to the best advantage when trained to a single stem, but it is doubtful if it would retain the arborescent form; though, if it did, it would have few rivals as an ornamental shrub.

7. *Spiræa* OPULIFOLIA.—N. America, 1690. Shrub 8-10 feet. Leaves sub-ovate, lobed, serrated. Flowers numerous, white, in roundish corymbs; capsules bladdery, reddish. The abundance of its flowers renders it very ornamental, and its beauty is heightened by the large, reddish, persistent capsules, which deck it after the flowers have faded away.

8. *Spiræa* SALICIFOLIA.—Russia, 1665. Shrub 4-6 feet. Leaves lanceolate, glabrous, toothed. Flowers white, in long spikes, abundant, very light and delicate.

9. *Spiræa* TRILOBATA.—Siberia, 1801. Shrub 2 feet. Leaves roundish, lobed, crenated, somewhat glabrous. Flowers white, in numerous compact corymbs. When well grown, it becomes in the flowering season one mass of snow-white blossoms, which all but conceal the foliage.

All the foregoing species of *Spiræa* possess the valuable quality of being very hardy, robust, and remarkably indifferent to soil and situation.

238. STAPHYLEA—(*Bladder-nut*).

CELASTRACEÆ—PENTANDRIA TRIGYNIA.

1. *Staphylea* PINNATA.—England (but rarely found wild). Shrub 10-12 feet. Leaves pinnate, leaflets 5-7. Capsules membranous and inflated, which give it a singular and distinctive appearance. The flowers are white and disposed in drooping racemes. The leaves are pretty, and so are the flowers, but the latter being mostly hidden under the rather dense foliage, almost escape the notice to which they are entitled.

2. *Staphylea* TRIFOLIA.—N. America, 1640. Shrub 8 feet. Leaves of 3 leaflets. Flowers white. Fruit a bladderly capsule. It is curious and interesting rather than ornamental, and does not, indeed, differ very much in appearance and growth from the preceding species.

239. STUARTIA.

TERNSTRÖMIACEÆ—MONADELPHIA PENTANDRIA.

1. *Stuartia* VIRGINICA.—Virginia, 1742. Shrub 8 feet. Leaves ovate, acute. Flowers large, white, with blue anthers, expanding in autumn. Thrives best in peat-soil. It is of somewhat slow growth, and rather shy of blooming, but the flowers are very beautiful and worth waiting for; and, as is the case with plants which remain long barren, when once the charm is broken and the flowering habit begins to prevail, it blossoms freely.

240. STYRAX—(*Storax*).

STYRACEÆ—DECANDRIA MONOGYNIA.

1. *Styrax* OFFICINALE.—Syria, 1597. Shrub 12-15 feet.

202 SYMPHORICARPOS (SNOWBERRY)—SYRINGA (LILAC).

Leaves ovate, smooth and shining above, sprinkled with hoary hairs beneath. Flowers white, somewhat similar to those of the orange, abundantly produced. This ornamental shrub is a little tender, but thrives well against a wall, and when in blossom fully repays the trouble of sheltering it. From incisions in the bark of this species there exudes the balsamic gum called storax, formerly much used for medicinal purposes. It will hardly thrive in the open air, except in the south of England.

241. SYMPHORICARPOS—(*St. Peterswort or Snowberry*).

CAPRIFOLIACEÆ—PENTANDRIA MONOGYNIA.

1. *Symphoricarpos* RACEMOSUS.—N. America, 1817. Shrub 6-10 feet. Leaves ovate, acuminate, glaucous beneath. Flowers small, red, in loose leafy racemes. Berries large, ovate, white, persistent, whence the common name, Snowberry. It is very hardy, and will readily grow in odd corners, or even under the drip of trees. There is a variety with blotched leaves (*R. fol. var.*) which is very handsome and ornamental.

242. SYRINGA—(*Lilac*).

OLEACEÆ—DIANDRIA MONOGYNIA.

1. *Syringa* EMODI.—Himalayas, 1836. Shrub 8-10 feet. Leaves oblong, attenuated at the base and acuminate at the apex, glaucous beneath. Flowers in terminal panicles, purple. It grows in a compact shape, and although it cannot emulate the good old sort in the beauty or fragrance of its flowers, it is still a very desirable shrub, and appears to be quite hardy.

2. *Syringa JOSIKÆA*.—Transylvania, 1833. Shrub 8-10 feet. Leaves elliptic-lanceolate, wrinkled, shining green above, white beneath. Flowers in panicles, of a darker purple and larger than those of the common lilac.

3. *Syringa PERSICA*.—Persia, 1640. Shrub 4-6 feet. Leaves lanceolate, smaller than those of the other species. Flowers in terminal panicles, light purple, copiously produced. The white variety is also very handsome, and both are peculiarly suitable for early forcing. In Paris the months of February and March are made gay with the premature blossoms of this plant. The variety *P. laciniata* has very curiously cut leaves, and is very pretty, and interesting.

4. *Syringa VULGARIS*.—Hungary, 1597. Shrub 10-12 feet. Leaves ovate-cordate, acuminate. Flowers in terminal panicles, light purple, fragrant. The white variety differs from the normal species chiefly in the colour of the flowers, and both are too well known and generally admired to require comment. There are several fine garden varieties ; but our old favourite, the common Lilac, will never be quite supplanted by newer pets.

243. TAMARIX—(*Tamarisk*).

TAMARICACEÆ—PENTANDRIA TRIGYNIA.

1. *Tamarix GALLICA*.—England. Evergreen shrub 15-20 feet. Leaves minute, clasping the stem. Flowers in paniced spikes, of a pale rose colour. This plant delights in the sea-breezes, and will thrive on the sea-shores where hardly any other tree or shrub will stand. It requires careful training to keep it to a good shape, as its natural tendency is to grow in a rambling inelegant manner. It may be pruned so as to form a hedge, but becomes rather stumpy after a time.

244. TAXODIUM—(*Deciduous Cypress*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Taxodium* DISTICHUM.—N. America, 1640. Deciduous tree 100-120 feet. Leaves in two rows, flat, pectinate, spreading horizontally, $\frac{1}{2}$ -inch long, light green, changing in autumn to a dull red. Cones roundish, 1-1 $\frac{1}{2}$ inch in diameter. In swamps, or near water, this tree grows to a great size, but it will adapt itself to any soil, and is exceedingly ornamental. It is quite hardy. The roots frequently throw out large and very curious excrescences.



TAXODIUM DISTICHUM.

Taxodium SEMPERVIRENS.
(See SEQUOIA SEMPERVIRENS.)

2. *Taxodium* SINENSE.—China, 1845. Deciduous tree 12-20 feet. Leaves linear, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, adpressed to the stem when young, but expanding and spreading in autumn, of a light green hue. Branches horizontal, the young shoots slender and finally pendulous. Cones ovate. One of the most elegant of the deciduous Coniferæ, and worthy of a place in every collection. Some botanists place this species under the genus *Glyptostrobus*, but the occurrence of male and female flowers on the same spike favours the present arrangement. It is of doubtful hardiness north of the Trent.

245. TAXUS—(*Yew*).

TAXACEÆ—DICECIA MONADELPHIA.

1. *Taxus ADPRESSA*.—Japan, 1844. Shrub 4-6 feet. Leaves oblong, $\frac{1}{4}$ -inch long, rounded at both ends, with a short spiny point, two-rowed, flat, of a sombre dark-green hue. Branches spreading horizontally, giving it the appearance of a spreading depressed shrub. It is of slow growth, but quite hardy. The leaves are neatly arranged in two rows.

2. *Taxus BACCATA*.—England. Tree 30-50 feet. Leaves disposed in two lateral rows, linear, rather revolute, about 1 inch long, dark green above, paler beneath. Flowers axillary. Fruit a scarlet berry, open at top, enclosing an oval nut. The tree is of slow growth, but very long-lived. It is used in English churchyards as is the Cypress in those of the East. The following varieties are worthy of notice:—

B. fastigiata (the Irish Yew) which is distinguished by its upright columnar habit of growth, and also by its leaves being scattered and not in ranks like the *T. baccata*.

B. Dovastoni, with horizontally-spreading branches, which give it quite a distinct appearance. This variety is monœcious, which character, if found to be constant, will entitle it to the dignity of a separate species.

B. elegantissima, a very showy variety with yellowish leaves, which give it a very well-marked and brilliant aspect. In May and June, whilst in early growth, it forms one compact mass of brownish-yellow foliage, affording a most striking and vivid contrast to the sombre hue of the parent species.

246. TECOMA—(*Trumpet Flower*).

BIGNONIACEÆ—DIDYNAMIA ANGIOSPERMA.

1. *Tecoma RADICANS*.—Virginia, 1640. A climbing shrub.

Corolla trumpet-shaped, scarlet and orange. Leaves pinnate. It fixes itself to trees or walls by rootlets from the branches, like the ivy. Its fine flowers and leaves entitle it to a prominent place in every collection. It is of rapid growth, and soon covers a large space of wall. It is probably hardy as far up as the Trent, but hardly more north than that.

247. THEA—(*Tea*.)

TERNSTRÖMIACEÆ—MONADELPHIA POLYANDRIA.

1. *Thea* VIRIDIS.—China, 1768. Evergreen shrub 8 feet. Leaves elliptic-oblong. Flowers white, fragrant. It is well worth a trial in the open air, where, if in a sheltered spot, in peat-soil, and with a slight protection in severe frosts, it proves nearly as hardy as the common Laurel. The Bohea is not so hardy and less elegant. Both are of slow growth. Their out-door culture can only be recommended in the southern parts of England.

248. THUIOPSIS.

CONIFERÆ—MONGECIA MONADELPHIA.

1. *Thuiopsis* DOLABRATA.—Japan, 1854. Tree 60-80 feet. Leaves 4-rowed, scale-formed, broad, thick, imbricated, rounded at the points, of a fine deep green hue, glossy, white beneath, the marginal ones clasping over, flattened. The branches pendulous at the ends, flattened. Cones small. Scales 8-10, reflexed at apex. A noble tree as described by travellers who have seen it in its full development, but of which the small specimens we now possess scarcely enable us to judge properly. There is a form of it with variegated leaves which seems quite as free a grower, and both are well deserving of a trial. As to the hardiness of this very

distinct species, it is impossible yet to speak with any certainty. But in the neighbourhood of London it has withstood several winters with impunity, and even produced cones, and there is every reason to hope that it may thrive in the open air even some degrees north of the latitude of London. Hitherto its growth has proved exceedingly slow—slower than that of any other tree attaining similar dimensions. But it may, after reaching a certain altitude, take a sudden spring, and develop itself with rapidity. Many Coniferæ exhibit the peculiarity of tardy growth when young, with great acceleration during adolescence. With deciduous trees the converse is the rule.

2. *Thuiopsis* LÆTEVIRENS.—Japan, 1862. Shrub 10-15 feet. Leaves 4-rowed, mostly embracing the stem, but partly free, pointed, of a beautiful pale green. A lovely compact shrub, with graceful and delicately-coloured foliage. There is very little doubt as to its proving hardy, at least in the southern parts of England, and, that point once settled, it is certain to become a popular plant.

Thuiopsis BOREALIS. (See CUPRESSUS NUTKAENSIS.)

249. THUJA—(*Arbor Vitæ*).

CONIFERÆ—MONCECIA MONADELPHIA.

Thuja FILIFORMIS. (See BIOTA PENDULA.)

1. *Thuja* GIGANTEA.—California, 1854. Tree 100-120 feet. Leaves small, scale-formed, blunt, thick in texture, in close opposite pairs, the marginal ones overlapping, of a pale glossy green. Branchlets flattened, channelled along the sides. Cones erect, 1 inch long, scales fleshy. A magnificent tree, growing vigorously in sandy soil, and presenting a very distinct and imposing appearance. Its flat glossy branchlets

have a character quite distinct from that of all other *Thujas*, and in its native woods, when in full majesty of growth, it must present a most imposing appearance. It has hitherto proved quite hardy.

2. *Thuja* LOBBII (or MENZIESII).—California, 1854. Tree 40-50 feet. Leaves in opposite pairs, closely imbricated, pointed, the marginal ones lapping over. Branchlets flattened, slender, numerous. Cones oval, tapering to both ends. A graceful, erect, and rapidly-growing tree, very hardy, and of agreeable aspect. It must become a general favourite, both from its beauty and from its usefulness. No Conifer is better fitted as a screen to more tender plants, for it grows with marvellous rapidity,—seems to defy wind, storm, and frost,—is densely clothed with foliage, and, in consequence of its compact and somewhat fastigate growth, may be planted in pretty close rows.

3. *Thuja* OCCIDENTALIS.—Canada, 1596. Tree, or fastigate shrub, 30-40 feet. Leaves small, opposite, closely imbricated and flattened, of a bright green colour. The branches are at first horizontal, then quite upright, and the smaller ones droop. Cones obovate, about $\frac{1}{2}$ of an inch long. A compact, upright shrub, of rather slow growth, but very hardy and thriving in almost any soil. It is well known under the popular name of American Arbor Vitæ.

Thuja ORIENTALIS. (See BIOTA ORIENTALIS.)

4. *Thuja* PLICATA (or WARREANA).—N.W. America, 1769. Tree 20 feet. Leaves imbricated in 4 rows, blunt, flat, smooth, of a bright glossy green, the marginal ones lapping over. Branchlets long, straight, flat, and covered with the closely flattened leaves, in opposite pairs, as if plaited. Cones small, solitary, ovate-oblong. It somewhat resembles the *T. occidentalis*, but is stouter and less fastigate in its growth. It appears to be quite hardy.

250. TILIA—(*Lime*).

TILIACEÆ—POLYANDRIA MONOGYNIA.

1. *Tilia* ALBA.—Hungary, 1767. Tree 50-60 feet. It is probably only a variety of the *T. Europæa*, from which it chiefly differs in the leaves being clothed with white down beneath, which peculiarity gives the tree a silvery appearance, especially when agitated by the wind. It is quite distinguishable at a distance by its whitish aspect.

2. *Tilia* AMERICANA. — Canada, 1752. Tree 60 feet. Leaves large, deeply and somewhat obliquely cordate. The flowers are similar to those of the *T. Europæa*, but the bark on the young shoots is of a dark brown colour; whereas in the European species it is of a more or less bright red. There is a variety called *A. pubescens*, in which the under surface of the leaves is somewhat downy, and which is of less vigorous growth. Both varieties are quite hardy.

3. *Tilia* EUROPÆA.—England. Tree 80-100 feet. Leaves cordate, acuminate, serrated, smooth, of a fine light green. Flowers greenish, fragrant, the peduncle bearing a large bract, to which the flowers are attached. A beautiful and well-known tree, producing valuable timber. There are several varieties of it, of which the most striking are—

E. platyphylla, with leaves much larger and rougher than the species, and branches more hispid.

E. laciniata, with leaves cut and twisted. It has a curious aspect, and never grows taller than 30 feet.

251. TORREYA—(*Californian Nutmeg*).

CONIFERÆ—DICECIA MONADELPHIA.

1. *Torreya* MYRISTICA.—California, 1848. Tree 20-30 feet. Leaves in 2 rows, 2-2½ inches long, tapering into a long, acute spine, pale green. Fruit drupaceous, 1½ inch in length, with a thin, green, fleshy covering. Branches spreading. An interesting tree, but wood, leaves, and fruit, all emit a disagreeable odour when bruised or burnt. It has, so far, proved to be tolerably hardy near London, but a few years must elapse before this can be considered a settled point.

252. TRAGOPYRUM—(*Goat Wheat*).

POLYGONACÆ—OCTANDRIA TRIGYNIA.

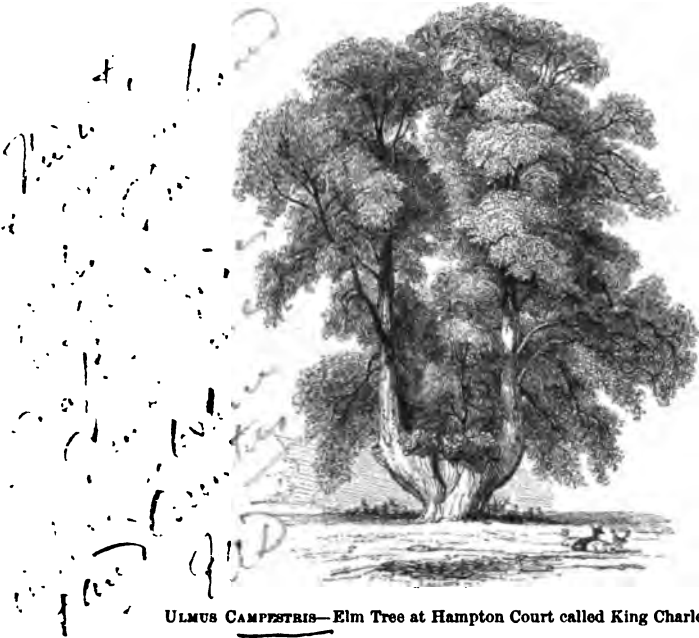
1. *Tragopyrum* LANCEOLATUM.—Siberia, 1770. Shrub 2-3 feet. Flowers white, tinged with pink, very numerous. Leaves lanceolate, hoary. This curious and pretty plant thrives best in peat-soil. It is seldom met with, but deserves not to be neglected in our borders.

253. ULMUS—(*Elm*).

ULMACEÆ—PENTANDRIA DIGYNIA.

1. *Ulmus* AMERICANA.—N. America, 1752.—Tree 80-100 feet. The chief distinctive peculiarities of this as compared with the British species, consist in the leaves being longer in proportion to their breadth, on longer footstalks, and more pointed, and in the bark being rougher. The variety *A. alba* (the White Elm) abounds throughout North America. It is quite hardy, as indeed are all the species of Elm enumerated below.

2. *Ulmus* CAMPESTRIS (English or Common Elm).—, England. Tree 60-80 feet. Leaves unequal at the base, rough, serrated. Flowers nearly sessile. A well-known and much-admired tree, of which there are several varieties. Of these the following are the most interesting :—



ULMUS CAMPESTRIS—Elm Tree at Hampton Court called King Charles' Twins.

C. Cornubiensis (Cornish Elm). A tall upright tree, with small, coriaceous and strongly-veined leaves.

C. viminalis. A very elegant and distinct variety, with numerous slender, twig-like branches, and small leaves, which, with its semi-pendulous habit, give it some resemblance to the Birch. The variety known as *U. gracilis* is identical with or very nearly allied to this.

C. nana (Dwarf Elm). It rarely grows beyond 6 feet in height, but forms an elegant tree-like bush, well clothed with foliage.

C. foliis variegatis (or *tricolor*). In this variety the leaves are largely blotched with white, and, when fully expanded, give the tree a very singular and (as a variety) attractive appearance.

3. *Ulmus* EFFUSA.—Russia, date of introduction uncertain. Tree 70-80 feet. Leaves large, pale green, unequal at the base, and doubly serrated. Flowers on rather long drooping peduncles. It comes into leaf two or three weeks before the common Elm, and is of more rapid growth. The head is also more spreading, the bark smoother, and the timber is as good.

4. *Ulmus* GLABRA.—England. Tree 80-100 feet. It is probably only a variety of the Montana, but the leaves are smaller and more oblong. They are very unequal at the base, and although firm, they are smoother than those of most elms, whence the specific name of the tree. There is a variety of this species called the *G. vegeta*, which is remarkable for its vigorous growth. When young it makes shoots of 6, 8, or 10 feet in length in one season, and rapidly assumes the dimensions of a large tree. This variety is commonly known by the name of the Huntingdon Elm.

Ulmus KAKI. (See PLANERA ACUMINATA.)

5. *Ulmus* MONTANA (Scotch or Wych Elm).—England. Tree 80-100 feet. It is a more spreading tree than the common Elm, and the branches generally have a graceful droop at their extremities. Leaves large, broadly elliptical, with a long point. The variety of pendulous Elm (*U. Montana pendula*) which originates from this species is a most beautiful and characteristic tree, that should be included in every collection.

6. *Ulmus* SUBEROSA (Cork Elm).—England. Tree 50 feet. The bark is covered with a thick cork in deep fissures.

Leaves much larger and more rounded than those of the common Elm, and also more unequal at the base. It is probably a mere variety of the *U. Montana*.



ULMUS MONTANA.

254. VACCINIUM—(*Whortleberry*).

ERICACEÆ—OCTO-DECANDRIA MONOGYNIA.

1. *Vaccinium* CORYMBOSUM.—N. America, 1765. Shrub 7-8 feet. Leaves elliptic, acute, rather large. Flowers in corymbose racemes, drooping, urn-shaped, white, with a tinge of red. Berries black, used for tarts, preserves, etc., like cranberries.

214 VELLA (SHRUBBY CRESS-ROCKET)—VERONICA (SPEEDWELL).

2. *Vaccinium* VITIS IDÆA.—England. Evergreen shrub 1 foot. Leaves obovate, shining, dark green, dotted beneath. Flowers in terminal drooping racemes, bell-shaped, pale pink. Berries red, edible when cooked; used largely in N. Europe for distilling, making jellies, etc. The bilberry is the fruit of the *V. myrtillus*, a frequent denizen of our heaths and stony moors. It is pretty, but hardly entitled to the trouble it would require to cultivate it in our gardens.

255. VELLA—(*Shrubby Cress-rocket*).

CRUCIFERÆ—TETRADYNAMIA SILICULOSA.

1. *Vella* PSEUDO-CYTISUS.—Spain, 1759. Evergreen shrub 4-5 feet. Leaves small, obovate, of a glaucous green. Flowers yellow, freely produced in early spring. It is sometimes killed in severe winters, but very little protection will save it; and it is interesting from being almost the only hardy woody shrub amongst the very numerous plants belonging to the large natural order of Cruciferæ or cabbage-worts. It will not stand open-air culture in our northern counties.

256. VERONICA—(*Speedwell*).

SCROPHULARIACÆ—DIANDRA MONOGYNIA.

1. *Veronica* DECUSSATA.—Falkland Islands, 1776. Evergreen shrub, 2 feet. Leaves ovate, rather fleshy, crossing each other in pairs at right angles (decussate), of a light-green colour. Flowers in spikes, numerous, of a bluish-white. A beautiful plant, heretofore considered too tender for our climate, but it has been found to bear our winter frosts in

the latitude of London, with some slight protection when the weather is severe. It is quite worth the trouble. It is, however, only in the southern counties, or in those bordering the sea on the north-west, that this native of a small island, with a temperature free from great extremes of cold and heat, can be expected to live in the open air.

2. *Veronica* SALICIFOLIA.—New Zealand, 1843. Ever-green shrub 3 feet. Leaves lanceolate, sessile, somewhat like those of some species of willows. Flowers in elongated lateral racemes, nearly white, abundant and very pretty. The remarks in regard to hardiness made in the case of the *V. decussata* also apply to the present species, and both are amply worthy of some extra attention. There is a hybrid between this and the *V. speciosa*, called *V. Andersoni*, which is very pretty and probably hardy.

257. VIBURNUM.

CAPRIFOLIACEÆ—PENTANDRIA TRIGYNIA.

1. *Viburnum* COTINIFOLIUM.—Nepal, 1831. Shrub 8-10 feet. Leaves large, roundish-oval, entire, grey with stellate down on both sides. Flowers white, in corymbs, stalks woolly, not very showy. It derives its chief attractions from the form and colour of its leaves, which, from grey in summer, change in autumn to a reddish tint. It does not appear to suffer from the cold of our winters.

2. *Viburnum* LENTAGO.—N. America, 1761. Shrub 6-10 feet. Leaves ovate, acuminate, sharply serrated. Flowers white, in corymbs. Fruit black, abundantly produced, very conspicuous when the plant is denuded of leaves. It appears to be quite hardy.

3. *Viburnum* MACROCEPHALUM.—China, 1845. Shrub

15-20 feet. Leaves ovate, glabrous, nearly entire. Flowers white, in large snowy balls, exceeding in size and brilliancy those of the old Guelder-rose, or even of the *V. plicatum*. It has hitherto proved quite hardy in the vicinity of London ; and when it has had time to develop itself into mature growth, bids fair to rank as the handsomest species of this handsome genus.

4. *Viburnum* OPULUS (var. STERILE—the Guelder-rose).—England. Shrub 10-12 feet. Leaves broad, three-lobed, acuminate, serrated. Flowers white, in large globular heads, abundantly produced, and so striking from its mass of pure white as to make its French name of “boule de neige” very appropriate. It is a variety of a common hedge-plant, whose chief beauty lies in the bright red berries with which it is adorned in autumn. The modest inflorescence of the parent forms a striking contrast to the dazzling brilliancy of its offspring's blossoms. Sterility is, however, the price paid by the latter for its ephemeral splendour.

5. *Viburnum* PLICATUM.—N. China, 1845. Shrub 10-12 feet. Leaves rounded, dentate, somewhat plaited, with prominent ribs, glossy, dark green above. Flowers similar to those of the Guelder-rose, but larger, whiter, and quite as abundantly produced. A very showy shrub, apparently quite hardy, and a welcome addition to our shrubberies.

6. *Viburnum* TINUS (the Laurestine).—S. Europe, 1596. Evergreen shrub 10-15 feet. Leaves ovate-oblong, entire. Flowers white, in corymbs. Berries dark blue. Its flowering in the winter months, its evergreen leaves, and its toleration of the shade and drip of trees, have deservedly general favourite. The two varieties, *T. hirta* (leaves dish and hairy beneath) and *T. lucida* (leaves

larger and shining), are also well worthy of notice. It sometimes sustains injury during severe frosts, and it is only in the milder parts of our island that it can be cultivated without danger of partial destruction.

258. VINCA—(*Periwinkle*).

APOCYNACEÆ—PENTANDRIA MONOGYNIA.

1. *Vinca* MAJOR.—England. Evergreen trailing shrub. Leaves ovate, acute, ciliated. Flowers of a fine purplish blue, on erect stems, the flowerless stems being trailing. It grows freely under the drip of trees, is densely clothed with fine foliage, and is well adapted for covering banks or rock-work where few other plants will thrive. There is a variety with variegated leaves which produces even larger flowers, and the foliage of which is exceedingly beautiful. It seems quite as hardy as the parent stock.

259. VIRGILIA—(*Yellow Wood*).

LEGUMINOSÆ—DECANDRIA MONOGYNIA.

1. *Virgilia* LUTEA.—N. America, 1812. Tree 20-30 feet. Leaves pinnate, leaflets 9-11, ovate, pointed, smooth, rather large. Flowers white, in pendulous racemes. The wood is remarkable for its deep yellow colour, whence its specific name. Its foliage is very beautiful and luxuriant, but unfortunately is shed rather early in autumn. It appears to be thoroughly hardy.

260. VISCUM—(*Mistletoe*).

LORANTHACEÆ—MONŒCIA TETRANDRIA.

1. *Viscum* ALBUM.—England. A parasitical evergreen

shrub. Leaves lanceolate, obtuse, nerveless. Flowers small, yellow. Fruit globular, white. Stems smooth and round. It grows on the bark of many species of trees, but in England mostly on apple-trees, and it sends its roots between the inner bark and the soft wood. It is not easy to propagate, and dies off when the tree or branch on which it lives becomes diseased. With some care, it can, however, be budded on the apple, thorn, poplar, and a few other trees.

261. VITIS—(*Vine*).

VITACEÆ—PENTANDRIA MONOGYNIA.

1. *Vitis* LABRUSCA.—N. America, 1656. A climbing plant, much resembling the *V. vinifera* (the common Grape-bearing Vine), but with larger leaves. Fruit large and black, but the flavour in the wild plants is not very agreeable. It is more ornamental as a climber than the species cultivated for their fruit, the size and luxuriance of its foliage being much greater.

2. *Vitis* VINIFERA (var. LACINIOSA or APIIFOLIA). A curious variety of the Grape-vine, the leaves of which are deeply and elegantly cut, so that it is difficult to recognise its parentage. It is sometimes called the Parsley-leaved vine. It appears to be quite hardy, and grown on a wall or trellis, is very ornamental.

262. VITEX—(*Chaste Tree*).

VERBENACEÆ—DIDYNAMIA ANGIOSPERMIA.

1. *Vitex* AGNUS CASTUS.—Sicily, 1570. Shrub 8 feet. Flowers in racemes or spikes, small, bluish white, rather fragrant. Leaves digitate, 5-7 lobed. It does not fruit in

England, and it is its foliage alone that constitutes its claim to notice. It is rather difficult of cultivation, and sometimes dies off rather unaccountably even in the warmer parts of our island, so that its hardiness in the north is very questionable.

263. WEIGELIA.

CAPRIFOLIACEÆ—PENTANDRIA MONOGYNIA.

1. *Weigelia* AMABILIS.—China, 1855. Shrub 12-15 feet. Leaves ovate-acuminate, large, obscurely crenated, rough, dark green above, pale beneath. Flowers in axillary panicles, light pink, abundantly produced. The habit of this plant differs largely from that of the *W. rosea* in its vigorous yearly shoots, which, from their length and weight, become arched and semi-pendent. Our ingenious horticulturists have already raised a host of varieties from this and the following species, some of them widely differing from, and others far exceeding in beauty, the original species from which they spring. Such mutations and improvements are, however, ephemeral, and seeds gathered (when produced, which does not always happen) from these hybrids revert to one or the other of the parent species, except when natural tendencies are again interfered with by artificial processes. Neither this nor the other species have so far exhibited any sensitiveness to the cold of our winters.

2. *Weigelia* ROSEA.—China, 1844. Shrub 6-8 feet. Leaves oblong acuminate, serrated, glabrous above. Flowers axillary, of a pale pink, very showy and copious. A delightful shrub, from which has sprung a numerous progeny of beautiful garden varieties, most of which deserve cultivation.

264. WELLINGTONIA—(*Mammoth Tree*).

CONIFERÆ—MONŒCIA MONADELPHIA.

1. *Wellingtonia* GIGANTEA.—California, 1854. Tree 300-400 feet. Leaves linear, $\frac{1}{2}$ of an inch long, tapering to an acute point, decurrent at the base, rounded, of a glaucous light green colour when young, becoming darker when old. Branches spreading horizontally, slender as compared with the main trunk, and when weighted with leaves, rather pendulous. Cones solitary, 2 inches long, ovate. This king of trees has only been found in one or two groves in the Sierra Nevada, where it towers to nearly twice the height of the highest trees previously known, with a trunk of proportionate diameter. It remains to be seen how this Leviathan of the forest will thrive in our soil and climate. Hitherto it has grown well, and although the foliage becomes browned in some of our winters, yet on the whole it has proved itself fairly entitled to be classed as a hardy tree, and it only remains to ascertain by experiment how far to the north of our island it may be domesticated.

265. WISTARIA.

LEGUMINOSÆ—DIADELPHIA DECANDRIA.

1. *Wistaria* SINENSIS.—China, 1818. A vigorous and rapid-growing climbing plant. Leaves pinnate ; leaflets 9-13. Flowers numerous, in long pendulous racemes, bluish, produced early in spring, with sometimes a second crop in autumn. A magnificent ornament to our walls and trellises, too well known and too universally appreciated to require either encomium or recommendation. The variety with white flowers is curious, but by no means preferable to the original species. Although it grows and flowers more luxuriantly in

XANTHORRHIZA (YELLOW-ROOT)—YUCCA (ADAM'S NEEDLE). 221

the milder temperature of South England, yet it is so robust as to justify the hope that its cultivation may extend far into the north.

266. XANTHORRHIZA—(*The Yellow Root*).

RANUNCULACEÆ—POLYANDRIA 1-3-GYNIA.

1. *Xanthorrhiza* APIIFOLIA.—N. America, 1766. Shrub 3-4 feet. Leaves pinnate. Flowers in terminal racemes, purplish-brown, produced early and abundantly. The creeping roots are full of a yellow juice, which, however, has not been applied to any useful purpose. The elegance of its foliage, the abundance of its flowers—which, though not showy, exhibit very peculiar tints—and the early period of the year at which it contributes its quota of ornament, combine to render this a very desirable plant. It appears to be quite hardy.

267. XANTHOXYLUM—(*Toothache Tree*).

XANTHOXYLACEÆ—DICECIA PENTANDRIA.

1. *Xanthoxylum* FRAXINEUM.—N. America, 1740. Small tree 8-10 feet. Leaves pinnate; leaflets 8-10, ovate. Flowers small, in axillary umbels, yellowish, with red anthers. The growth is slow, but although it never attains any great size, it has all the habit and appearance of a tree. The bark has a hot taste, and has been used as a remedy for the toothache, whence its popular name; but its medicinal properties have by no means obtained universal currency.

268. YUCCA—(*Adam's Needle*).

LILIACEÆ—HEXANDRIA MONOGYNIA.

1. *Yucca* ALOÏFOLIA.—S. America, 1690. Evergreen

shrub 10-12 feet. Leaves similar to those of the *Y. gloriosa*, but slightly serrated. Flowers numerous, bell-shaped, in a spike 2-3 feet long. In an old plant, the tall tough stem forms a very picturesque object, and, although not quite so hardy as some of its congeners, is well worth the precaution of cultivating it in a sheltered situation. It is of doubtful hardiness in the north and east of England.



YUCCA GLORIOSA.

2. *Yucca FILAMENTOSA*.—Virginia, 1670. Evergreen shrub, very similar in all respects to the *Y. gloriosa*, except that the leaves are obtuse, serrated, and have long threads hanging from their sides, which give it a very peculiar appearance. It is hardy, at least throughout the greatest part of England, and forms a very attractive object, although it does not attain the same size as some of the other species.

3. *Yucca GLORIOSA*.—N. America, 1596. Evergreen shrub 3-4 feet. Leaves long, broad, stiff, ending in a sharp, black spine. Flowers numerous, on a long stalk, sometimes 3 feet high, bell-shaped, pendulous, white with a purple stripe outside. A beautiful plant, with a palm-tree habit, and quite hardy, unless in the extreme north of England.

269. ZENOBIA.

ERICACEÆ—DECANDRIA MONOGYNIA.

1. *Zenobia SPECIOSA* (var. *PULVERULENTA*).—N. Carolina, 1800. Evergreen shrub 3-4 feet. Leaves roundish-ovate, crenated, sprinkled over with a whitish powder. Flowers in racemes, drooping, large, bell-shaped, of a pure white and very elegant. A beautiful shrub, thriving best in peat, and, when in flower, one of the handsomest of the Ericaceæ. It is, by some botanists, included amongst the Andromedas.

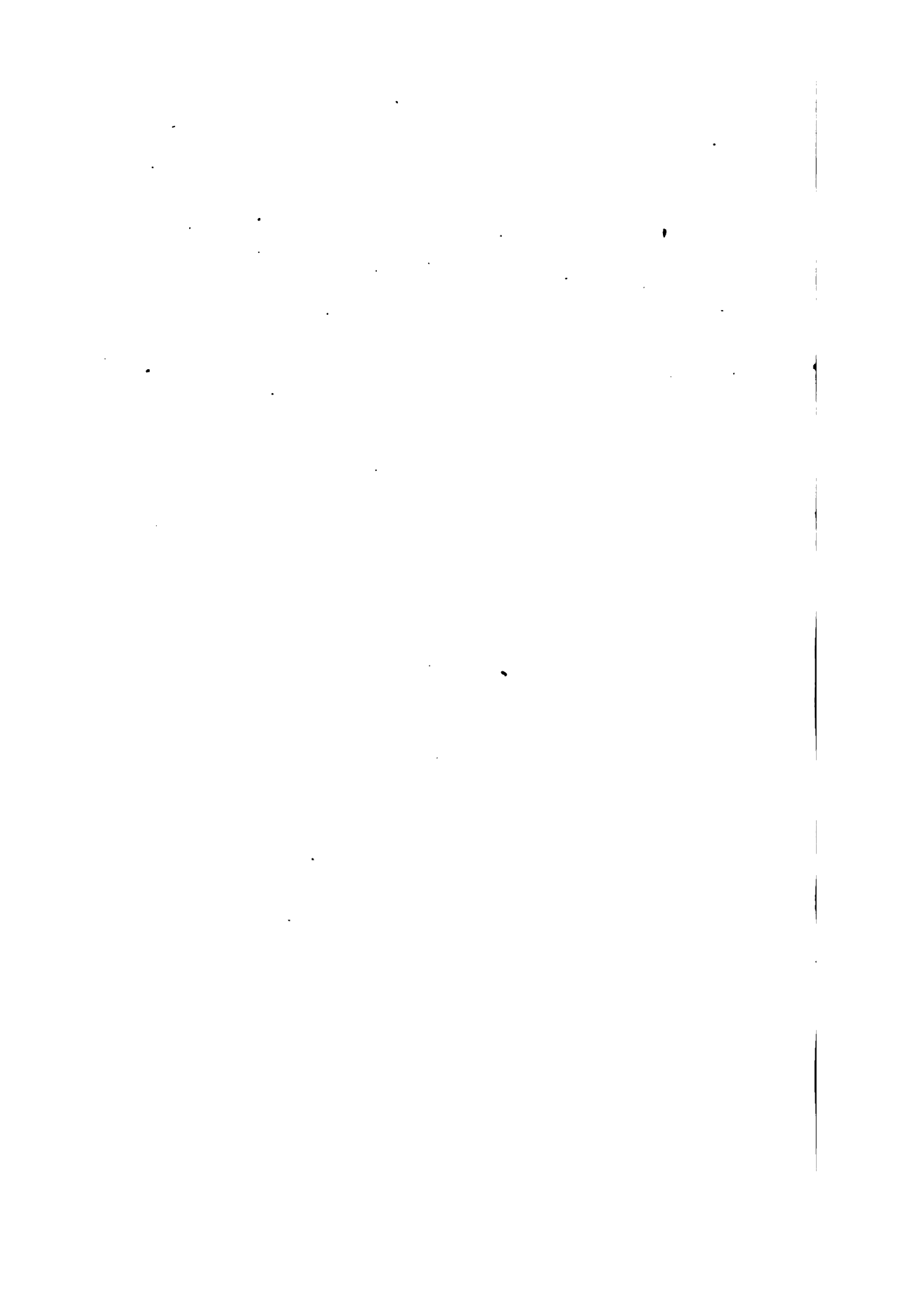


ARAUCARIA IMBRICATA—Dropinore.



ARAUCARIA IMBRICATA,

DROPMORE.



PART II.



INTRODUCTION.

IN the first part we have recorded all the species of hardy Trees and Shrubs which we consider entitled to a place in our gardens and plantations, and we now proceed to classify them under various aspects, such as size, habit, foliage, inflorescence, and other peculiarities. This analysis will enable any one who may consult the work to arrive without trouble at the special knowledge he may be in search of, as to the merits, capabilities, and aptitude for his requirements of the several plants enumerated.

In this part, therefore, the 621 species described in the First Part are distributed into various groups, each embodying some speciality. By this method all such plants are collected together, which, under the different points of view, are closely related.

A general survey of the various heads under which these groups are respectively arranged, and of the information which may be elicited from such classification, can, at a glance, be obtained either from the Table of Contents prefixed to the work, or from the Index at the end of the volume.



CYNERIUM ARGENTEUM.

CHAPTER FIRST.

CLASSIFICATION OF SPECIES INTO GROUPS OF VARIOUS HEIGHTS— LISTS OF TRAILING AND OF CLIMBING SHRUBS.

IN forming plantations, one of the most essential requisites is the knowledge of the heights which the trees and shrubs that it is intended to plant will respectively attain at maturity. How often do we see tall and vigorous trees eclipsing the view of fine shrubs of middle size thoughtlessly placed behind them, so that, instead of an amphitheatre of foliage and blossom, what is presented to the eye is a tangled net of trunks, stems, branches, and twigs. The only remedy (and that an incomplete one) is the cruel process of transplantation. If, however, the cure is difficult, the prevention is easy. It consists in simply ascertaining the probable dimensions of each tree before fixing its place. For this purpose, all the species enumerated in this work are in this chapter classified into groups, according to their heights. Thus the 621 species described are found to consist of—

100 that attain the height of 60 feet and upwards ;

94 " " 30 to 60 feet ;

100 " " 15 to 30 "

96 " " 8 to 15 "

157 " " 2 to 8 "

18 of which the height is below 2 feet ;

26 trailing or procumbent shrubs ;

and 30 twining and climbing shrubs.

It will be observed that, curiously enough, the first four groups contain about the same number of species ; and as they are selected from a collection indiscriminately formed,

we may infer that throughout the range of nature a somewhat similar proportion exists in respect to sizes, except in the extreme cases of the hyperborean regions where vegetation is stunted, and of the tropical zone where it is largely expanded under exceptionally favourable conditions.

In planting young trees for ornamental purposes, the following dilemma is of constant occurrence. If trees are placed at such distances that, when full-grown, they shall not interfere with and injure each other, the plantation will for a number of years present a nude and jejune appearance. On the other hand, if, irrespective of the future, they are planted so close as speedily to fill the intervening spaces, they in a few years become a tangled brake. The trees, by close contact, lose their lower branches, and with them much of their individual beauty. True, recourse may be had to thinning, but where different species are originally intermixed with a view to permanent companionship, the removal of a portion of them destroys the symmetry of the primary plan, nor can the distances ever be properly regulated by the process of thinning, consistently with ulterior and lasting effect. The best way, probably, of evading this difficulty, is at once to plant the trees intended to remain permanently, at such distances as will render the future removal of any of them unnecessary, and to fill up the intervening spaces (which will diminish year by year) with common shrubs of small value. When these shall have performed their allotted purpose of clothing with verdure those naked spaces, they may be removed without injury to the permanent plantation, and probably with little injury to themselves.

An additional very interesting group might be formed, selected partly from the smaller shrubs enumerated in this chapter, and partly from dwarf varieties, which, not being botanical species, are not comprised in the list. From this source a dwarf arboretum might be reared, in which many of

TREES ATTAINING THE HEIGHT OF 60 FEET AND UPWARDS.

Of the 621 species described in the present volume, there are 99 which attain the height of from 60 to 250 feet, and one, the *Wellingtonia gigantea*, which soars far above all the rest. The greatest number range from 60 to 100 feet, several from 100 to 150 feet, and only a few tower above that altitude. The following is a list of the species included in this division. The height is specially indicated when it reaches or exceeds 120 feet, but it must be borne in mind that the maximum size is only attained under the most favourable combination of soil and climate :—

LIST 2.

<i>Abies Albertiana</i>	. 140 feet.	<i>Cedrus Libani.</i>
<i>Douglasii</i>	. 180 "	<i>Celtis crassifolia.</i>
<i>excelsa</i>	. 150 "	<i>Cephalotaxus Fortuni.</i>
<i>grandis</i>	. 180 "	<i>Chamæcyparis sphæroides.</i>
<i>Lowii</i>	. 200 "	<i>Cryptomeria Japonica.</i>
<i>Menziesii.</i>		<i>Cupressus Lawsoniana.</i>
<i>nigra.</i>		<i>Nutkaensis.</i>
<i>nobilis</i>	. 200 "	<i>Dacrydium Franklinii.</i>
<i>Nordmanniana.</i>		<i>Fagus sylvatica.</i>
<i>orientalis.</i>		<i>Fraxinus excelsior.</i>
<i>picea</i>	. 150 "	<i>Gleditschia triacanthos.</i>
<i>pindrow.</i>		<i>Juglans cinerea.</i>
<i>pinsapo.</i>		<i>nigra.</i>
<i>Smithiana</i>	. 140 "	<i>regia.</i>
<i>Æsculus hippocastanum.</i>		<i>Larix Americana.</i>
<i>Ailantus glandulosa.</i>		<i>Europeæa.</i>
<i>Araucaria imbricata</i>	. 150 "	<i>Liriodendron tulipifera.</i>
<i>Betula alba.</i>		<i>Negundo fraxinifolium.</i>
<i>Bhojputtra.</i>		<i>Nyssa villosa.</i>
<i>lenta.</i>		<i>Pinus Austriaca</i>
<i>nigra.</i>		. 120 feet.
<i>papyracea.</i>		<i>Benthamiana</i>
<i>Carya alba.</i>		. 200 "
<i>amara.</i>		<i>Cembra.</i>
<i>olivæformis.</i>		<i>excelsa</i>
<i>porcina.</i>		. 120 "
<i>Castanea vesca.</i>		<i>insignis.</i>
<i>Cedrus Atlantica.</i>		<i>Jeffreyi</i>
<i>Deodara</i>	. 180 "	. 150 "
		<i>laricio.</i>
		<i>Lambertiana</i>
		. 200 "
		<i>macrocarpa.</i>
		<i>mitis.</i>

Pinus pinaster.		Quercus pedunculata.	
ponderosa.		prinus.	
radiata.		rubra.	
Sabiniana .	120 feet.	sessiliflora.	
strobis .	130 "	Retinospora obtusa.	
sylvestris.		Salisburia adiantifolia.	
Planera acuminata.		Salix alba.	
Platanus occidentalis.		Russelliana.	
orientalis.		Sciadopytis verticillata	120 feet.
Podocarpus Totara.		Sequoia sempervirens	250 "
Populus acerifolia.		Sophora Japonica.	
alba.		Taxodium distichum .	120 "
angulata.		Thuja gigantea .	120 "
balsamifera.		Thuiopsis dolabrata.	
fastigiata .	140 "	Tilia Europæa.	
monilifera .	120 "	Ulmus Americana.	
tremula.		canpestris.	
Quercus Egilops.		effusa.	
alba		glabra.	
cerris.		montana.	
palustris.		Wellingtonia gigantea	400 "

HEIGHT 30 TO 60 FEET.

This division embraces those trees which range between 30 and 60 feet in height. They are 94 in number. It must be borne in mind that some attain their maturity very quickly, others very slowly, so that if a plantation is formed of mixed trees with a view to uniformity, other circumstances must be taken into calculation beyond the mere ultimate capability of growth of the trees. Some spring up with amazing luxuriance when young, and (as a pretty general rule) arrive quickly at maturity, and sink with equal rapidity to decay ; whilst others grow somewhat slowly but steadily, and do not attain their maximum development till long after the others have passed away. It is amongst the deciduous species that the most rapid growers and shortest livers occur, whilst the evergreen, and especially the coniferous trees, are steadier in their development, and attain greater age. There are several exceptions to this general rule, such as Oaks, Elms, and other deciduous trees, but they only disprove its universality, not its prevalence.

LIST 3.

- Abies* alba.
 Canadensis.
 Cephalonica.
Acacia dealbata.
 Julibrissin.
 lophantha.
Acer circinatum.
 eriocarpum.
 Lobelii.
 macrophyllum.
 Monspessulanum.
 obtusatum.
 platanoides.
 pseudo-platanus.
 rubrum.
 saccharinum.
 villosum.
Æsculus rubicunda.
Alnus cordifolia.
 glutinosæ.
Carpinus betulus.
Catalpa syringæfolia.
Celtis Australis.
 occidentalis.
Cerasus Virginiana.
 vulgaris.
Corylus Colurna.
Cunninghamia Sinensis.
Cupressus funebris.
 macrocarpa.
 sempervirens.
Cytisus alpinus.
 laburnum.
Diospyros lotus.
 Virginiana.
Fagus antarctica.
 Cunninghami.
 ferruginea.
Fraxinus juglandifolia.
Gleditschia ferox.
 Sinensis.
Gymnocladus Canadensis.
Ilex aquifolium.
 opaca.
Juniperus excelsa.
 Virginiana.
Kölreuteria paniculata.
- Laurus* nobilis.
 Sassafras.
Libocedrus Chilensis.
Liquidambar styraciflua.
Lyonia arborea.
Maclura aurantiaca.
Magnolia acuminata.
 auriculata.
 conspicua.
 grandiflora.
 macrophylla.
 tripetala.
Morus alba.
 rubra.
Ostrya vulgaris.
Paulownia imperialis.
Pinus Brutia.
 pineæ.
 rigida.
Planera Richardi.
Populus candicans.
 Græca.
 nigra.
Pseudolarix Kæmpferi.
Pterocarya Caucasica.
Pyrus aucuparia.
 torminalis.
Quercus fastigiata.
 Gramuntia.
 heterophylla.
 Ilex.
 lanata.
 lanceolata.
 nigra.
 phellos.
 suber.
 virens.
Robinia pseudacacia.
 viscosa.
Salix Babylonica.
 caprea.
Taxus baccata.
Thuja Lobbii.
 occidentalis.
Tilia alba.
 Americana.
Ulmus suberosa.

HEIGHT 15 TO 30 FEET.

The following group forms a connecting link between trees and shrubs. The distinction between these two terms is not so much dependent on size as on habit. A tree is generally understood to be a plant of which the trunk is, under ordinary circumstances, divested of branches up to a certain height ;— whereas in a shrub, there is a tendency to permanent ramification from the lowest part of the stem. In exceptional cases, trees retain their lowest branches, and thus acquire a shrub-like habit ; and, on the other hand, by careful pruning, a shrub may be made to assume an arborescent shape.

Of species ranging between the given heights of 15 and 30 feet there are 100, and they form a very interesting assortment of deciduous and evergreen, of fine-foliaged and fine-flowering species.

LIST 4.

<i>Acer campestre.</i>	<i>Caragana arborescens.</i>
<i>oblongum.</i>	<i>Carpinus Americana.</i>
<i>palmatum.</i>	<i>Castanea chrysophylla.</i>
<i>spicatum.</i>	<i>Cerasus Caroliniana.</i>
<i>striatum.</i>	<i>laurocerasus.</i>
<i>Tataricum.</i>	<i>Lusitana.</i>
<i>Æsculus glabra.</i>	<i>Padus.</i>
<i>Amelanchier botryapium.</i>	<i>semperflorens.</i>
<i>Amygdalus communis.</i>	<i>Cercis siliquastrum.</i>
<i>Aralia Japonica.</i>	<i>Chamærops excelsa.</i>
<i>spinosa.</i>	<i>Chionanthus Virginica.</i>
<i>Arbutus Andrachne.</i>	<i>Cornus florida.</i>
<i>procera.</i>	<i>mascula.</i>
<i>Unedo.</i>	<i>Corylus Avellana.</i>
<i>Armeniaca vulgaris.</i>	<i>Cotoneaster frigida.</i>
<i>Aucuba Japonica.</i>	<i>Cratægus Aronia.</i>
<i>Benthamia fragifera.</i>	<i>Azarolus.</i>
<i>Biota orientalis.</i>	<i>coccinea.</i>
<i>pendula.</i>	<i>cordata.</i>
<i>Broussonetia papyrifera.</i>	<i>crus-galli.</i>
<i>Bumelia tenax.</i>	<i>macracantha.</i>
<i>Buxus Balearica.</i>	<i>Mexicana.</i>
<i>sempervirens.</i>	<i>oxyacantha.</i>
<i>Camellia Japonica.</i>	<i>punctata.</i>

<i>Cratægus tanacetifolia.</i>	<i>Pinus Banksiana.</i>
<i>Cryptomeria elegans.</i>	<i>Mughus.</i>
<i>Cydonia vulgaris.</i>	<i>Pistacia vera.</i>
<i>Cytisus albus.</i>	<i>Podocarpus nubigena.</i>
<i>Elæagnus hortensis.</i>	<i>Ptelea trifoliata.</i>
<i>parvifolia.</i>	<i>Punica granatum.</i>
<i>Euonymus Europæus.</i>	<i>Pyrus Aria.</i>
<i>Ficus Carica.</i>	<i>salicifolia.</i>
<i>Halesia tetraptera.</i>	<i>spectabilis.</i>
<i>Hamamelis Virginica.</i>	<i>Quercus glabra.</i>
<i>Hippophaë rhamnoides.</i>	<i>Pyrenaïca.</i>
<i>Ilex cornuta.</i>	<i>Retinospora pisifera.</i>
<i>latifolia.</i>	<i>Rhamnus Alaternus.</i>
<i>Juniperus Chinensis</i>	<i>Rhododendron arboreum.</i>
<i>oblonga pendula.</i>	<i>Rhus Cotinus.</i>
<i>Lomatia longifolia.</i>	<i>typhina.</i>
<i>Magnolia glauca.</i>	<i>Salix acutifolia.</i>
<i>Mespilus Germanica.</i>	<i>candida.</i>
<i>Morus nigra.</i>	<i>pentandra.</i>
<i>Oreodaphne Californica.</i>	<i>Shepherdia argentea.</i>
<i>Ornus Europæa.</i>	<i>Tamarix Gallica.</i>
<i>Paliurus aculeatus.</i>	<i>Taxodium Sinense.</i>
<i>Pavia Californica.</i>	<i>Thuja plicata.</i>
<i>rubra.</i>	<i>Torreya myristica.</i>
<i>Phillyrea latifolia.</i>	<i>Viburnum macrocephalum.</i>
<i>Photinia serrulata.</i>	<i>Virgilia lutea.</i>

HEIGHT 8 TO 15 FEET.

Of the whole number of species described, there are 96 which come within the limits of growth mentioned above, and of these the following is a list :—

LIST 5.

<i>Acer Creticum.</i>	<i>Borya ligustrina.</i>
<i>polymorphum.</i>	<i>Buddlea globosa.</i>
<i>Alnus viridis.</i>	<i>Calycanthus floridus.</i>
<i>Aloysia citriodora.</i>	<i>macrophyllus.</i>
<i>Amorpha fruticosa.</i>	<i>Ceanothus azureus.</i>
<i>Amygdalus orientalis.</i>	<i>intermedius.</i>
<i>Persica.</i>	<i>Cephalanthus occidentalis.</i>
<i>Aristolelia Macqui.</i>	<i>Colutea arborescens.</i>
<i>Baccharis halimifolia.</i>	<i>Cornus alba.</i>
<i>Bambusa Metakè.</i>	<i>Coronilla Emerus.</i>

<i>Cratægus parvifolia.</i>	<i>Pavia macrostachya.</i>
<i>pyracantha.</i>	<i>Philadelphus coronarius.</i>
<i>spathulata.</i>	<i>grandiflorus.</i>
<i>Desfontainea spinosa.</i>	<i>verrucosus.</i>
<i>Deutzia scabra.</i>	<i>Phillyrea ilicifolia.</i>
<i>Elæagnus argentea.</i>	<i>media.</i>
<i>reflexa.</i>	<i>Piptanthus Nepalensis.</i>
<i>Erica arborea.</i>	<i>Quercus ilicifolia.</i>
<i>Codonodea.</i>	<i>Raphiolepis ovata.</i>
<i>Escallonia macrantha.</i>	<i>Retinospora filifera.</i>
<i>Euonymus Japonicus.</i>	<i>Rhamnus catharticus.</i>
<i>latifolius.</i>	<i>frangula.</i>
<i>Fontanesia phillyreoides.</i>	<i>Rhododendron Ponticum.</i>
<i>Forsythia suspensa.</i>	<i>Ribes aureum.</i>
<i>viridissima.</i>	<i>sanguineum.</i>
<i>Glyptostrobos heterophyllus.</i>	<i>speciosum.</i>
<i>Gordonia pubescens.</i>	<i>Robinia hispida.</i>
<i>Griselinia macrophylla.</i>	<i>Salix helix.</i>
<i>Halesia diptera.</i>	<i>purpurea.</i>
<i>Jaasminum fruticans.</i>	<i>Sambucus racemosa.</i>
<i>nudiflorum.</i>	<i>Spartium junceum.</i>
<i>revolutum.</i>	<i>Spiræa arizæfolia.</i>
<i>Juniperus communis.</i>	<i>Lindleyana.</i>
<i>Hibernica.</i>	<i>opulifolia.</i>
<i>Phœnicea.</i>	<i>Staphylea pinnata.</i>
<i>Kalmia latifolia.</i>	<i>Styrax officinale.</i>
<i>Kerria Japonica.</i>	<i>Syringa Emodi.</i>
<i>Laurus Benzoin.</i>	<i>Josikæa.</i>
<i>Leycesteria formosa.</i>	<i>vulgaris.</i>
<i>Ligustrum Japonicum.</i>	<i>Thuiopsis lætevirens.</i>
<i>vulgare.</i>	<i>Viburnum cotinifolium.</i>
<i>Magnolia purpurea.</i>	<i>Lentago.</i>
<i>Mahonia Nepalensis.</i>	<i>opulus.</i>
<i>Malachodendron ovatum.</i>	<i>plicatum.</i>
<i>Myrica Californica.</i>	<i>Tinus.</i>
<i>cerifera.</i>	<i>Weigelia amabilis.</i>
<i>Myricaria Germanica.</i>	<i>Xanthoxylum fraxineum.</i>
<i>Panax horridum.</i>	<i>Yucca aloifolia.</i>

HEIGHT 2 TO 8 FEET.

The ornamental plants, of which the height ranges from 2 to 8 feet, number 157, and form fully one quarter of the total of species described in this work. There is amongst them a larger proportion of flower-bearers than

amongst any of the other sections. They can either be used in shrubberies as a foreground to the taller species, or in borders intermingled with herbaceous plants. They also possess the advantage of displaying great beauties in a small space, and consequently are peculiarly adapted to adorn small suburban gardens, the owners of which are seldom deterred by the expense (which after all is not great) of studding them with choice specimens. It is the difficulty of selecting the right plants (right as to size, right as to flower or foliage, right as to soil, hardiness, etc.) which constitutes their chief embarrassment. The "bedding out" system has for some years past materially conduced to relieve them from this perplexity. But it has many drawbacks, which may perhaps before long materially diminish the favour and prevalence it now enjoys, particularly where space and money are considerations. In the first place, bedding-out plants are an annual expense, as they die out, and have to be replaced each successive season. Secondly, they are ornamental only from July to October. Indeed, when the seasons are unfavourable, unless the soil or the process of cultivation be first-rate, August and September are the only two months in which bedding-out plants exhibit their beauties in perfection. What is the aspect of these beds during the remaining eight months of the year? No sooner have the first frosts withered the leaves of the Geraniums or Petunias than they have to be removed. The beds are of course placed in the most prominent part of the garden, so as to catch the eye when arrayed in their gaudiest costume. But when stripped of it, they become mere patches of bare soil, and for two-thirds of the year create a painful impression of nakedness and sterility. It is true that, where money is a secondary consideration, the temporary expedient of plunging into those beds during winter and spring pots containing evergreens can be resorted to. But this implies the dilemma of unsightliness on the one hand, or of

considerable expenditure on the other. Thirdly, with all the profusion of blossom and gorgeousness of colour that result from large masses or long lines of the same kind of flower, the eye, dazzled and delighted at first, by degrees becomes sated and cloyed, and admiration soon subsides into indifference. The same space, and less money, devoted to the cultivation of flowering shrubs and perennial herbaceous plants, would yield equal beauty, infinitely greater variety, and would never leave the soil totally unoccupied. The interest we feel in watching the development of foliage or expansion of blossom, where the species are diversified, is lost when we glance over the symmetrical but formal lines or curves, and the brilliant but monotonous colouring which constitute the attractions of the "bedding out" system.

The following 157 species are selected as the most desirable out of the immense number of English and foreign ligneous plants that come within those limits of size to which alone this section refers.

LIST 6.

<i>Adenocarpus intermedius.</i>	<i>Berberis stenophylla.</i>
<i>Amorpha fragrana.</i>	<i>Betula nana.</i>
<i>Amygdalus nana.</i>	<i>Bupleurum fruticosum.</i>
<i>Andromeda floribunda.</i>	<i>Calophaca Wolgarica.</i>
<i>polifolia.</i>	<i>Caragana jubata.</i>
<i>Androsæmum officinale.</i>	<i>spinosa.</i>
<i>Anthyllis barba-Jovis.</i>	<i>Cassandra calyculata.</i>
<i>Aralia Sieboldtii.</i>	<i>Ceanothus Americanus.</i>
<i>Artemisia Abrotanum.</i>	<i>Chenopodium fruticosum.</i>
<i>Asimina triloba.</i>	<i>Chimonanthus fragrans.</i>
<i>Atraphaxis spinosa.</i>	<i>Cineraria maritima.</i>
<i>Atriplex halimus.</i>	<i>Cistus Cyprius.</i>
<i>Azalea nudiflora.</i>	<i>laurifolius.</i>
<i>Pontica.</i>	<i>purpureus.</i>
<i>viscosa.</i>	<i>Clethra alnifolia.</i>
<i>Berberidopsis corallina.</i>	<i>tomentosa.</i>
<i>Berberis concinna.</i>	<i>Colletia horrida.</i>
<i>Darwinii.</i>	<i>Comptonia asplenifolia.</i>
<i>dealbata.</i>	<i>Coriaria myrtifolia.</i>
<i>dulcis.</i>	<i>Cydonia Japonica.</i>

- Cytisus patens.*
 Weldeni.
Daphne collina.
 Gnidium.
 laureola.
 Mezereum.
 Pontica.
Desmodium penduliflorum.
Deutzia gracilis.
Diervilla Canadensis.
Dirca palustris.
Ephedra distachya.
Erica Australis.
 stricta.
 tetralix.
Escallonia illinita.
 pterocladon.
 rubra.
Eugenia Ugni.
Euonymus alatus.
 radicans.
Eurybia ilicifolia.
Exochordia grandiflora.
Fothergilla alnifolia.
Fraxinus Xanthoxyloides.
Garrya elliptica.
 macrophylla.
Gaultheria Shallon.
Genista radiata.
Grabowakia Boerhaavifolia.
Griselinia littoralis.
Halimodendron argenteum.
Hibiscus Syriacus.
Hydrangea arborescens.
 hortensia.
 nivea.
 quercifolia.
Hypericum hircinum.
 Nepalense.
Illicium Floridanum.
 religiosum.
Indigofera decora.
Itea Virginica.
Juniperus recurva.
 sabina.
 sabinoides.
Kalmia angustifolia.
- Lavendula spica.*
Ledum palustre.
Leptospermum lanigerum.
Leucothoë spinulosa.
Ligustrum coriaceum.
Lonicera Ledebourii.
Lyonia racemosa.
Mahonia aquifolium.
 Japonica.
Menziesia globularis.
Myrica Gale.
Myrtus communis.
Nitraria Schoberi.
Olea ilicifolia.
Ononis fruticosa.
Osmanthus ilicifolius.
Pæonia Moutan.
Pavia discolor.
Pernettya mucronata.
Phlomis fruticosa.
Podocarpus Koraiana.
Prinos glaber.
Prunus Sinensis.
 triloba.
Pyrus arbutifolia.
Quercus coccifera.
Retinospora ericoidea.
Rhododendron campanulatum.
 Catawbiense.
 ciliatum.
 Dauricum.
Rhodora Canadensis.
Rhus copallina.
Ribes rubrum (multiflorum).
Rosa ferox.
 rubiginosa.
 sulphurea.
Rubus Nutkanus.
 spectabilis.
Ruscus racemosus.
Ruta graveolens.
Salix lanata.
Santolina chamæcyparissus.
Serissa fœtida.
Skimmia Japonica.
 laureola.
 oblata.

<i>Spiræa bella.</i>	<i>Tragopyrum lanceolatum.</i>
<i>callosa.</i>	<i>Vaccinium corymbosum.</i>
<i>chamædrifolia.</i>	<i>Vella pseudo-cytisus.</i>
<i>lævigata.</i>	<i>Veronica decussata.</i>
<i>salicifolia.</i>	<i>salicifolia.</i>
<i>trilobata.</i>	<i>Vitex agnus-castus.</i>
<i>Staphylea trifolia.</i>	<i>Weigelia rosea.</i>
<i>Stuartia Virginica.</i>	<i>Xanthorrhiza apiifolia.</i>
<i>Symphoricarpus racemosus.</i>	<i>Yucca filamentosa.</i>
<i>Syringa Persica.</i>	<i>gloriosa.</i>
<i>Taxus adpressa.</i>	<i>Zenobia speciosa.</i>
<i>Thea viridis.</i>	

SHRUBS BELOW 2 FEET IN HEIGHT AND CLIMBING PLANTS.

The following three groups consist—First, of erect shrubs growing from 1 to 1½ feet in height. These are mostly ever-green, and, amongst other ornamental uses to which they are applicable, might form a pretty miniature winter garden. Secondly, of procumbent or trailing shrubs, admirably adapted for rock-work, intermixed as they might be with Sedums, Saxifrages, Sempervivums, and other dwarf herbaceous plants, technically called “alpines.” Thirdly, of twining or climbing shrubs. These are endowed with the peculiar faculty of attaching themselves to trees, walls, trellises, etc., by means of tendrils and rootlets, or by twining round and round them—some species from left to right, others from right to left—and are consequently of infinite service in covering and concealing unsightly objects. Most of them are of exceedingly rapid growth, and many are distinguished for the beauty, fragrance, and abundance of their blossoms. The thirty species enumerated are selected as most desirable, and many of them, however undeserving of neglect, are almost unknown and scarcely ever seen:—

LIST 7.

SHRUBS 1 TO 1½ FOOT IN HEIGHT—18 in number.

<i>Ammyrsine buxifolia.</i>	<i>Azalea procumbens.</i>
<i>Astragalus tragacantha.</i>	<i>Calluna vulgaris.</i>

<i>Cassiope tetragona.</i>	<i>Phyllodoce taxifolia.</i>
<i>Corema alba.</i>	<i>Potentilla fruticosa.</i>
<i>Daboecia polifolia.</i>	<i>Rhododendron chamæcistus.</i>
<i>Erica carnea.</i>	<i>ferrugineum.</i>
<i>ciliaria.</i>	<i>Ruscus hypoglossum.</i>
<i>multiflora.</i>	<i>Vaccinium vitis-idaea.</i>
<i>Iberis sempervirens.</i>	<i>Viscum album.</i>

PROCUMBENT OR TRAILING SHRUBS—26 in number.

<i>Arctostaphylos Uva-ursi.</i>	<i>Helianthemum crœcum.</i>
<i>Cerasus depressa.</i>	<i>grandiflorum.</i>
<i>Cotoneaster microphylla.</i>	<i>hyssopifolium.</i>
<i>thymifolia.</i>	<i>sulphureum.</i>
<i>Cytisus purpureus.</i>	<i>Hypericum calycinum.</i>
<i>Daphne Cneorum.</i>	<i>Juniperus prostrata.</i>
<i>Diotis ceratoidea.</i>	<i>Linnæa borealis.</i>
<i>Empetrum nigrum.</i>	<i>Oxycoccus macrocarpus.</i>
<i>Epigæa repens.</i>	<i>Polygala chamæbuxus.</i>
<i>Gaultheria procumbens.</i>	<i>Polygonum vacciniifolium.</i>
<i>Genista sagittalis.</i>	<i>Rubus laciniatus.</i>
<i>triquetra.</i>	<i>Salix herbacea.</i>
<i>Helianthemum canescens.</i>	<i>Vinca major.</i>

TWINING AND CLIMBING SHRUBS—30 in number.

<i>Akebia quinata.</i>	<i>Lonicera Japonica.</i>
<i>Ampelopsis hederacea.</i>	<i>periclymenum.</i>
<i>Veitchii.</i>	<i>sempervirens.</i>
<i>Aristolochia Siph.</i>	<i>Lycium Europæum.</i>
<i>Bignonia capreolata.</i>	<i>Menispermum Canadense.</i>
<i>Clematis flammula.</i>	<i>Passiflora cœrulea.</i>
<i>florida.</i>	<i>Periploca Græca.</i>
<i>lanuginosa.</i>	<i>Rosa Banksiæ.</i>
<i>viticella.</i>	<i>Smilax rotundifolia.</i>
<i>Hedera helix.</i>	<i>sarsaparilla.</i>
<i>Regnieriana.</i>	<i>Solanum jasminoidea.</i>
<i>Jasminum officinale.</i>	<i>Tecoma radicans.</i>
<i>Lardizabala biternata.</i>	<i>Vitis Labrusca.</i>
<i>Lonicera brachypoda</i> aureo-reti- <i>culata.</i>	<i>vinifera laciniosa.</i>
<i>confusa.</i>	<i>Wistaria Sinensis.</i>

CHAPTER SECOND.

CLASSIFICATION OF SPECIES INTO GROUPS WITH REFERENCE TO THEIR FOLIAGE, VIZ. :—EVERGREEN PLANTS—FINE FOLIAGED PLANTS — PLANTS WITH VARIEGATED LEAVES — WITH COLOURED LEAVES — WITH SILVERY LEAVES — AND WITH FRAGRANT LEAVES.

VIEWING plants as mere objects of beauty, and setting aside all considerations of their utility in ministering to our wants and luxuries, the main features that arrest our attention are their foliage, their flowers, and their fruit. This chapter will be devoted to a review of their several merits in respect to foliage.

1. The first and most obvious distinction is between those plants which are evergreen and those which are deciduous. At a first glance, the superiority of those trees that are clothed with perennial verdure over those which are bereft of leaves for four or five months out of the twelve, would appear indisputable; but, as in many other instances of "first impressions," there is much to be considered before giving a final verdict. As a rule, the persistent leaves of evergreens are of a dark and sombre hue, whereas the young and tender leaves of deciduous trees, when they come out in early spring, "gratâ vice veris et Favoni," are mostly of a lovely light green, redolent of youth and hope, fresh as infancy, suggestive of the past, as succeeding an extinct generation, and of the future, as hurrying through a brief career to a similar fate. Compare the Scotch fir (*Pinus sylvestris*) with the larch (*Larix Europæa*). The first is evergreen, but its dark and melancholy leaves, whilst they endure

the cold blasts and nipping frosts of winter, remain cheerless even in spring; whereas the larch (often intermingled with the former), bursting into leaf as soon as winter relents, becomes a pyramid of tender light-green foliage, and offers to it a contrast as great as that between 'jocund youth and crabbed age.'

Even in winter, the spray of deciduous trees and shrubs is very diversified, often very graceful and elegant, and always highly interesting to the lovers of nature.

The following list of all the evergreen species described in this work will render it easy to select such a proportion of them as the taste of the planter or the exigencies of his soil and situation may make desirable.

In the subjoined list, wherever *all* the species of the genus are evergreen, the total number of the species is given; but where some of the species are evergreen and some deciduous, the evergreen species are individually named.

LIST 8.

Abies	17 species.	Brought forward	39 species.
Ammysrine	1 "	Buxus	2 "
Andromeda	2 "	Calluna	1 "
Androsæmum	1 "	Camellia	1 "
Anthyllis	1 "	Cassandra	1 "
Aralia Sieboldtii	1 "	Cassiope	1 "
Araucaria	1 "	Castanea chrysophylla	1 "
Arbutus	3 "	Cedrus	3 "
Arctostaphylos	1 "	Cephalotaxus	1 "
Aristotelia	1 "	Cerasus Caroliniana, lau-	
Artemisia	1 "	rocerasus, Lusitanica	3 "
Atriplex	1 "	Chamæcyparissus	1 "
Aucuba	1 "	Chamærops	1 "
Bambusa	1 "	Chenopodium	1 "
Berberidopsis	1 "	Cineraria	1 "
Berberis Darwinii, ste-		Cistus	3 "
nophylla	2 "	Corema	1 "
Biota	2 "	Cotoneaster microphylla,	
Bupleurum	1 "	thymifolia	2 "
Carried forward	39 species.	Carried forward	63 species.

Brought forward . 63 species.		Brought forward 147 species.	
Crataegus pyracantha .	1 "	Lomatia .	1 "
Cryptomeria .	2 "	Lonicera brachypoda	
Cunninghamia .	1 "	var. (aureo-retic.), Ja-	
Cupressus .	5 "	ponica, sempervirens	3 "
Dabœcia .	1 "	Magnolia glauca, gran-	
Dacrydium .	1 "	diflora .	2 "
Daphne Cneorum, col-		Mahonia .	3 "
lina, Gnidium, lau-		Menziesia .	1 "
reola, Pontica .	5 "	Myrica Californica,	
Desfontainea .	1 "	cerifera .	2 "
Empetrum .	1 "	Myrtus .	1 "
Ephedra .	1 "	Olea .	1 "
Epigœa .	1 "	Oreodaphne .	1 "
Erica .	8 "	Osmanthus .	1 "
Escallonia .	4 "	Oxycoccus .	1 "
Eugenia .	1 "	Pernettya .	1 "
Euonymus Japonica,		Phillyrea .	3 "
radicans .	2 "	Phlomis .	1 "
Eurybia .	1 "	Photinia .	1 "
Fagus antarctica, Cun-		Phyllodoce .	1 "
ninghami .	2 "	Pinus .	21 "
Garrya .	2 "	Piptanthus .	1 "
Gaultheria .	2 "	Podocarpus .	3 "
Glyptostrobus .	1 "	Polygala .	1 "
Griselinia .	2 "	Prinos .	1 "
Hedera .	2 "	Quercus coccifera, gla-	
Helianthemum .	5 "	bra, Gramuntia, Ilex,	
Hypericum calycinum	1 "	lanceolata, suber, vi-	
Iberis .	1 "	rens .	7 "
Ilex .	4 "	Raphiolepis .	1 "
Illicium .	2 "	Retinospora .	4 "
Jasminum revolutum .	1 "	Rhamnus Alaternus .	1 "
Juniperus .	11 "	Rhododendron .	8 "
Kalmia .	2 "	Ruscus .	2 "
Lardizabala .	1 "	Ruta .	1 "
Laurus nobilis .	1 "	Santolina .	1 "
Lavandula spica .	1 "	Sciadopytis .	1 "
Ledum .	1 "	Sequoia .	1 "
Leptospermum .	1 "	Serissa .	1 "
Leucothœ .	1 "	Skimmia .	3 "
Libocedrus .	1 "	Smilax .	2 "
Ligustrum coriaceum,		Tamarix .	1 "
Japonicum .	2 "	Taxus .	2 "
Linnaea .	1 "	Thea .	1 "

Carried forward 147 species.

Carried forward 235 species.

Brought forward	235 species.	Brought forward	246 species.
Thuiopsis	2 "	Viburnum Tinus	1 "
Thuja	4 "	Vinca	1 "
Torreya	1 "	Viscum	1 "
Vaccinium vitis-idaea	1 "	Wellingtonia	1 "
Vella	1 "	Yucca	3 "
Veronica	2 "	Zenobia	1 "
Carried forward	246 species.		254 species.

It will thus be observed that of the 621 species forming the materials of this work, upwards of 40 per cent are evergreen—a much larger proportion than would generally be supposed. It must, however, be borne in mind that of the 254 evergreen species of which a list is given, no less than 85 belong to the coniferous tribe, the firs and pines (*Abies* and *Pinus*) alone numbering 38.

2. *Species distinguished for the Size, Beauty, or Shape of their Leaves.*—These form an interesting group of plants, with elegant or curious leaves, both evergreen and deciduous, from which those who give a preference to the more permanent attraction of foliage over the comparatively ephemeral charms of flowers, can select a varied assortment. In many, however, of the species the two beauties are combined, and in such the requirements of both tastes are met.

LIST 9.

Acacia dealbata.	Aristolochia Sipro.
Julibrissin.	Aucuba Japonica.
lophantha.	Bambusa Metakè.
Acer obtusatum.	Betula alba urticifolia.
platanoides laciniatum.	Bigonia capreolata.
villosum.	Broussonetia papyrifera.
Ailantus glandulosa.	Camellia Japonica.
Alnus glutinosa imperialis.	Carya alba.
Aralia Japonica.	olivæformis.
spinosa.	Castanea vesca.
Sieboldii.	Catalpa syringæfolia.
Araucaria imbricata.	Celtis crassifolia.

- Cephalotaxus Fortunii.
 Cerasus laurocerasus.
 Virginiana.
 Chamærops excelsa.
 Cineraria maritima.
 Comptonia asplenifolia.
 Corylus Avellana heterophylla.
 Cryptomeria elegans.
 Cunninghamia Sinensis.
 Elæagnus reflexa.
 Escallonia macrantha.
 Fagus sylvatica heterophylla.
 Ficus Carica.
 Fraxinus excelsior crispa.
 Garrya macrophylla.
 Griselinia macrophylla.
 Gymnocladus Canadensis.
 Hedera Regnieriana.
 Hydrangea hortensis.
 Ilex latifolia.
 cornuta.
 Juglans cinerea.
 regia.
 regia laciniata.
 Laurus Sassafra.
 Ligustrum coriaceum.
 Liriodendron tulipifera.
 Magnolia auriculata.
 grandiflora.
 macrophylla.
 tripetala.
 Mahonia Japonica.
 Nepalensis.
 Menispermum Canadense.
 Nyssa villosa.
 Olea ilicifolia.
 Oreodaphne Californica.
 Ornus Europæa.
 Panax horridum.
 Paulownia imperialis.
 Pavia Californica.
 macrostachya.
 Phillyrea ilicifolia.
 Photinia serrulata.
 Pinus insignis.
 macrocarpa.
 Pistacia vera.
 Populus acerifolia.
 Pseudolarix Kämpferi.
 Ptelea trifoliata.
 Pterocarya Caucasica.
 Pyrus aria.
 Quercus Ægilops.
 glabra.
 Gramuntia.
 heterophylla.
 lanata.
 nigra.
 palustris.
 Quercus phellos.
 prinus.
 rubra.
 Raphiolepis ovata.
 Rhododendron arboreum.
 campanulatum.
 Catawbiense.
 ciliatum.
 Rhus copallina.
 typhina.
 Robinia hispida.
 Rubus laciniatus.
 Nutkanus.
 spectabilis.
 Ruscus hypoglossum.
 racemosus.
 Salisburia adiantifolia.
 Sciadopytis verticillata.
 Skimmia laureola.
 oblata.
 Smilax rotundifolia.
 Sarsaparilla.
 Spiræa Lindleyana.
 Syringa Persica laciniata.
 Tilia Europæa laciniata.
 Torreya myristica.
 Vitex agnus-castus.
 Vitis Labrusca.
 vinifera laciniosa.
 Yucca aloifolia.
 filamentosa.
 gloriosa.

3. *Species remarkable for the Variegation of their Foliage.*—

The curious discoloration which occurs in the leaves of some plants is sometimes very partial, and sometimes affects nearly the entire leaf. It no doubt arises from an abnormal and probably morbid change in the constitution of the chlorophyll or colouring matter of the leaves. It affects individuals and not species, and is therefore propagated by artificial means, such as budding, grafting, etc., and not by seed. But out of a large sowing, an occasional variegated seedling frequently occurs, from which, if sufficiently distinct and attractive, cuttings, grafts, etc., are taken. The discoloration generally assumes a white or yellow tint, but occasionally other colours also are substituted for the normal green. How far the tendency to variegation can be excited and promoted by artificial culture, still remains problematic, but that such agency is more or less effectual is probable from the fact that the great majority, as well as the most ornamental, of our variegated plants are derived from one source—viz. Japan. Unless we suppose that Nature has especially predisposed Japanese plants to variegation (a very desperate hypothesis), the phenomenon must be due to art. If so, we must admit that in this branch of gardening, as well as in that of dwarfing trees, the Japanese far excel us, consoling ourselves with the consideration that, in both cases, the objects attained are of little value. Indeed, so much is this the case in respect to the variegation of leaves, that to many persons this peculiarity is distasteful. But whilst, in not a few instances, the variegation imparts to the leaves a sickly hue and an unpleasant impression of disease; and whilst it is true that, in general, trees with such particoloured foliage are of slow growth, diminished size, and short-lived; on the other hand, it is undeniable that many species are gorgeous in colour, impart a gay and diversified aspect to the groups amongst which they figure, and form distinctive and prominent objects

which catch the eye and arrest the attention of the observer. They are, of course, only to be used to mix with and relieve other shrubs, as nothing could be more monotonous than a plantation in which the variegated species should largely predominate. In the following list an asterisk is prefixed to those species which are considered to be the most beautiful and distinct.

LIST 10.

- | | |
|--------------------------------------------|---------------------------------|
| Acer pseudo-platanus, fol. var. | *Mahonia Japonica. |
| *Aucuba Japonica, f. v. | *Negundo fraxinifolium, f. v. |
| Chamæcyparis sphæroides, f. v. | Osmanthus ilicifolius, f. v. |
| Euonymus Japonica, f. v. | *Retinospora pisifera argentea. |
| *Euonymus radicans, f. v. | *Retinospora pisifera aurea. |
| Fagus sylvatica, f. v. | Salix caprea tricolor. |
| *Hedera helix, f. v., several varieties. | Serissa foetida, f. v. |
| *Ilex aquifolium, f. v., many varieties. | *Skimmia Japonica. |
| Kerria Japonica, f. v. | *Taxus baccata elegantissima. |
| *Lonicera brachypoda, v. aureo-reticulata. | Thuiopsis dolabrata, f. v. |
| | *Ulmus campestris, f. v. |
| | *Vincea major, f. v. |

4. *Species remarkable for the peculiar Colour of their Foliage.*

—In some cases a change from green to other colours (more or less bright) occurs in autumn, and precedes the fall of the leaf in deciduous trees by a period varying from a fortnight to a month. A great number of species exhibit this change of tint in a minor degree, but the list given comprises only those in which this property is prominently marked. It is to this peculiarity that our landscapes owe their glowing beauty in the months of October and November. During this transition period between the vigorous vegetation of summer and the torpor of winter, masses of foliage assume numberless hues and shades of colour, red and yellow predominating, which, especially when the sun's declining rays fall obliquely upon them, astonish and delight the beholder. Charming as is the spectacle in this country, it is far exceeded in the forests of North America, in which a larger proportion of the trees die

off in glowing tints than with us. Were the best out of the following list freely interspersed with other trees in our forests and plantations, the autumnal tints which we so much admire would acquire additional splendour.

LIST 11.

<i>Acer Monspessulanum.</i>	<i>Larix Europæa.</i>
<i>platanoides.</i>	<i>Ligustrum ovalifolium.</i>
<i>Amelanchier botryapium.</i>	<i>Liquidambar styraciflua.</i>
<i>Ampelopsis hederacea.</i>	<i>Liriodendron tulipifera.</i>
<i>Azalea</i> (several varieties).	<i>Nyssa villosa.</i>
<i>Betula alba.</i>	<i>Pseudolarix Kæmpferi.</i>
<i>nana.</i>	<i>Pyrus arbutifolia.</i>
<i>Biota orientalis.</i>	<i>Quercus nigra.</i>
<i>aurea.</i>	<i>palustris.</i>
<i>Cotoneaster acuminata.</i>	<i>rubra.</i>
<i>Cryptomeria elegans.</i>	<i>Retinospora ericoides.</i>
<i>Euonymus alatus.</i>	<i>Spiræa prunifolia.</i>
<i>radicans.</i>	<i>Taxodium distichum.</i>
<i>Glyptostrobus heterophyllus.</i>	<i>Viburnum cotinifolium.</i>
<i>Kolreuteria paniculata.</i>	

In several other cases, a peculiar colour is imparted to the leaves when first expanded, which is retained with more or less intensity until their fall. What effect trees with coloured foliage judiciously (but it should also be sparingly) interspersed can produce, any one may conceive who has seen a fine specimen of the purple beech. The following are the most striking amongst this class of plants :—

LIST 12.

- ACER PLATANOIDES—v. COLCHICUM RUBRUM.** Leaves very smooth, and when mature of a bright red.
- POLYMORPHUM ATROPURPUREUM.** Colour dark purple, very permanent
- RUBRUM.** The leaves at the extremity of the branches are of a bright red, especially when first developed.
- AMPELOPSIS VEITCHII.** Leaves of a reddish colour, turning to a rich brown in autumn.
- BIOTA ORIENTALIS AUREA,** commonly known as **THUJA AUREA.** Leaves

and branchlets of a fine golden colour, especially vivid in early summer ; reddish-brown in winter.

CASTANEA CHRYSOPHYLLA. The under surface of the leaves is of a bright yellow, giving the tree, when sufficiently tall to present the back of the leaf to the eye, a very unique appearance.

CORYLUS AVELLANA PURPUREA. Leaves (as also the calyx and fruit of a fine dark purple.

FAGUS SYLVATICA ATRORUBENS (the Purple Beech). It is sometimes very dark, approaching to black, and sometimes of lighter shades, verging on a reddish-brown, when it is termed the Copper Beech ; but in all its gradations of colour it is a striking object.

PISTACIA VERA. Foliage when first developed of a fine dark crimson hue, which gradually merges into a reddish-green as the season advances.

PUNICA GRANATUM. Like the preceding, the young leaves are of a bright dark crimson, which colour, after a time, fades into green.

QUERCUS LANCEOLATA. Leaves of a fine purple, especially when young, becoming less vivid, but still very striking, later in the summer.

THUIOPSIS LÆTE-VIRENS. Leaves and branchlets of a peculiarly pale, glaucous, delicate green colour.

5. *Species remarkable for the Silvery or Glaucous appearance of their Leaves.*—This is one of the many deviations from general types in which multiform nature delights. In this group, the leaves are no longer green, but some are white with silky down, etc., others powdered over with a mealy substance, others have a glaucous or pea-green tinge, etc. etc. ; but all are interesting, if only from this very eccentricity, whilst many are intrinsically ornamental. In planting, it is useful to bear in mind the members of this division, as they may be made very effective in forming contrasts of colours, and the following list of them will prove serviceable to that end :—

LIST 13.

<i>Abies nobilis.</i>	<i>Atriplex halimus.</i>
<i>Amygdalus Orientalis.</i>	<i>Baccharis halimifolia</i>
<i>Anthyllis barba-Jovis.</i>	<i>Buddlea globosa.</i>
<i>Astragalus tragacantha.</i>	<i>Bupleurum fruticosum.</i>
<i>Atraphaxis spinosa.</i>	<i>Cineraria maritima.</i>

Diotis ceratoides.	Pyrus salicifolia.
Elæagnus argentea.	Quercus lanata.
hortensis.	Ruta graveolens.
Halimodendron argenteum.	Salix alba.
Lavandula spica.	candida.
Leptospermum lanigerum.	lanata.
Nitraria Schoberi.	Santolina chamæcyparissua.
Phlomis fruticosa.	Shepherdia argentea.
Pinus macrocarpa.	Tragopyrum lanceolatum.
Sabiniana.	Viburnum cotinifolium.
Pyrus aria.	Zenobia speciosa pulverulenta.

6. *Species remarkable for the Fragrance of their Leaves when bruised.*—To a limited number of shrubs the privilege has been accorded of bearing leaves, which, when bruised, emit an agreeable odour. It exists but in few instances as compared with the frequent occurrence of fragrant flowers. Nor can the scent from the leaves vie in exquisite flavour with that secreted from the blossoms of plants. But on the other hand, flowers are ephemeral, whilst foliage, even where not persistent during winter, endures for two-thirds of the year. The perfume exhaled from leaves is at all times perceptible, and that consideration may incite us to appreciate and cherish those plants to which the gift has been imparted.

Subjoined is the too short list of the species thus favoured :—

LIST 14.

Aloysia citriodora.	Laurus nobilis.
Artemisia abrotanum.	Lavandula spica.
Betula lenta.	Liquidambar styraciflua.
Cerasus Padus.	Myrica Gale.
Comptonia asplenifolia.	Myrtus communis.
Escallonia macrantha.	Oreodaphne Californica.
Illicium Floridanum.	Populus balsamifera.
religiosum.	Rosa rubiginosa.
Juglans regia.	

CHAPTER THIRD.

CLASSIFICATION OF SPECIES INTO GROUPS WITH REFERENCE TO
THEIR FLOWERS—SPECIES WITH SHOWY OR ABUNDANT
BLOSSOMS—WITH FRAGRANT BLOSSOMS—WINTER FLOWER-
ING SPECIES.

THE flower-garden, as now cultivated, owes its most numerous, if not its most striking attractions, to herbaceous, bulbous, and annual plants. These, showy and charming as they are when in blossom, can boast of little or no beauty when the flowering season is past. Shorn of their transitory splendour, their leaves and stems soon decay, and most of them either entirely die down during winter or exhibit the mere ruins of their departed glory. Not so with trees and shrubs. Many of these display floral beauties which equal or surpass those of the herbaceous tribe, without losing the more enduring attractions imparted to them by fine foliage, elegance of form, or majesty of dimensions. Several of them, moreover, possess the additional advantage of bearing savoury or ornamental fruit to gratify the palate in autumn, or charm the eye during winter.

From the first of the following two lists, it will be seen that nearly one-third of the 621 species described in the first part of this work are distinguished by the beauty or abundance of their flowers ; and from the second list that about one-tenth possess the additional prerogative of fragrant blossoms. Few outside of the limited circle of professional horticulturists are aware of the existence of so numerous an array of flowering trees and shrubs of all sizes, of great diversity of inflorescence, and of continuous yearly increase of floral productiveness. Some bear their flowers in early spring—*Florido picta vere corolla* ;

others protract theirs till late in autumn ; and a favoured few brave the winter frosts and unfold their painted petals from amidst their snow-clad branches.

It is true that some of the larger-sized and longest-lived trees do not bear flowers till they have attained certain dimensions ; but they compensate for this by the luxuriance of their bloom when they have reached that stage. And, after all, these form a small minority, as most species commence the flowering process at an early period of their existence.

LIST 15.

Species of which the Flowers are showy or abundant.

- | | |
|-----------------------------|-------------------------------|
| Acer rubrum. | Cerasus Virginiana. |
| Adenocarpus intermedius. | vulgaris fl. pleno. |
| Æsculus hippocastanum. | Cercis siliquastrum. |
| rubicunda. | Chionanthus Virginica. |
| Alnus viridis. | Cistus (all the species). |
| Amelanchier botryapium. | Clematis lanuginosa. |
| Ammyrsine buxifolia. | viticella. |
| Amygdalus communis. | Colletia horrida. |
| Persica. | Cornus florida. |
| Andromeda floribunda. | Coronilla Emerus. |
| Arbutus Andrachne. | Cratægus cordata. |
| procera. | crus-galli. |
| Unedo. | pyracantha. |
| Armeniaca vulgaris. | oxyacantha (the pink and |
| Azalea (all the species). | double varieties). |
| Berberidopsis corallina. | Cydonia Japonica. |
| Berberis concinna. | Cytisus (all the species). |
| Darwinii. | Dabœcia polifolia. |
| dulcis. | Daphne Cneorum. |
| stenophylla. | Gnidium. |
| Calluna vulgaris fl. pleno. | mezereum. |
| Camellia Japonica. | Desfontainea spinosa. |
| Castanea vesca. | Desmodium penduliflorum. |
| Catalpa syringæfolia. | Deutzia gracilis. |
| Ceanothus Americanus. | scabra. |
| azureus. | Elæagnus parvifolia. |
| intermedius. | Erica (all the species). |
| Cephalanthus occidentalis. | Escallonia (all the species). |
| Cerasus Caroliniana. | Exochordia grandiflora. |
| Padus. | Forsythia suspensa. |
| semperflorens. | viridissima. |

- Fothergilla alnifolia*.
Garrya elliptica.
Genista (all the species).
Halesia (both species).
Helianthemum (all the species).
Hibiscus Syriacus.
Hydrangea hortensis.
 quercifolia.
Hypericum (all the species).
Iberis sempervirens.
Indigofera decora.
Kalmia (all the species).
Kerria Japonica.
Lardizabala biternata.
Ledum palustre.
Leptospermum lanigerum.
Ligustrum Japonicum.
Liriodendron tulipifera.
Lomatia longifolia.
Lonicera (all the species).
Lycium Europæum.
Lyonia racemosa.
Magnolia (all the species).
Mahonia aquifolium.
 Nepalensis.
Malachodendron ovatum.
Menziesia globularis.
Mespilus Germanica.
Myricaria Germanica.
Myrtus communis.
Nitraria Schoberi.
Ononis fruticosa.
Ornus Europæa.
Oxycoccus macrocarpus.
Pæonia Moutan.
Passiflora cærulea.
Paulownia imperialis.
Pavia (all the species).
Periploca Græca.
Pernettya mucronata.
Philadelphus (all the species).
Phlomis fruticosa.
Pinus Cembra.
Piptanthus Nepalensis.
Polygala chamæbuxus.
Polygonum vacciniifolium.
Populus monilifera.
Potentilla fruticosa.
- Prunus Sinensis*.
 triloba.
Punica granatum.
Pyrus arbutifolia.
 aucuparia.
 spectabilis.
Raphiolepis ovata.
Rhododendron (all the species).
Rhodora Canadensis.
Rhus Cotinus (pedicels).
Ribes aureum.
 sanguineum.
 speciosum.
Robinia (all the species).
Rosa (all the species).
Rubus Nutkanus.
 spectabilis.
Ruta graveolens.
Salix lanata.
 pentandra.
Santolina chamæcyparissus.
Skimmia Japonica.
 laureola.
Solanum jasminoides.
Sophora Japonica.
Spartium junceum.
Spiræa (all the species).
Staphylea pinnata.
Stuartia Virginica.
Styrax officinale.
Syringa (all the species).
Tamarix Gallica.
Tecoma radicans.
Tragopyrum lanceolatum.
Vella pseudo-cytisus.
Veronica (both species).
Viburnum macrocephalum.
 opulus.
 plicatum.
 Tinus.
Vinca major.
Virgilia lutea.
Weigelia amabilis.
 rosea.
Wistaria Sinensis.
Xanthorrhiza apiifolia.
Yucca (all the species).
Zenobia speciosa pulverulenta.

FRAGRANT FLOWERS.

The most delicious scents are those emanating from flowers; and wonderful is their variety, as no two species exhale precisely the same odour. Many herbaceous plants enjoy this property, and are deservedly prized for it; but the flowers of no less than sixty of the trees and shrubs described in this work possess it also in an eminent degree, as the following list will show.

LIST 16.

Species of which the Flowers are fragrant.

Acacia dealbata.	Ligustrum Japonicum.
Julibrissin.	vulgare.
Acer macrophyllum.	Lonicera confusa.
Akebia quinata.	Japonica.
Aristolochia Siphon.	periclymenum.
Buddlea globosa.	Lyonia racemosa.
Calycanthus (both species).	Magnolia glauca.
Chimonanthus fragrans.	grandiflora.
Clematis flammula.	macrophylla.
Clethra (both species).	tripetala.
Cratægus oxyacantha (and most other species, more or less).	Olea ilicifolia.
Daphne Cneorum.	Pavia macrostachya.
collina.	Philadelphus coronarius.
Gnidium.	Pyrus aucuparia.
Pontica.	Raphiolepis ovata.
Epigæa repens.	Robinia pseudacacia.
Eurybia ilicifolia.	Rosa (nearly all the species).
Fothergilla alnifolia.	Rubus spectabilis.
Gordonia pubescens.	Salix pentandra.
Hydrangea arborescens.	Skimnia Japonica.
Illicium Floridanum.	laureola.
religiosum.	Syringa vulgaris.
Jasminum officinale.	Thea viridis.
revolutum.	Tilia (all the species).
Lavandula spica.	Vitex agnus-castus.

WINTER-FLOWERING SPECIES.

The following list comprises those species which develop their flowers during the winter months, and enliven that dreary season by their gay, and, in several instances, fragrant blossoms. In every garden where the arrangements permit, a small plot ought to be devoted specially to the cultivation of these rare and interesting exceptions to the law which almost universally governs the periods of floral development. A wall to the north, and some shelter from evergreen hedges to the north-east and south-west would form a suitable site, and this nook would offer a singularly inviting spectacle during winter. Frost, snow, storm, and cloud, might be paramount throughout, shedding their torpid influence over the vegetable world, and yet, in the midst of this scene of desolation, like an oasis in the desert, would stand out this little Eden, exposed and unprotected like the rest, but, strong in its exceptional procreative tendencies, it would display its gay blossoms and emulate the glories of spring. This would be a sight no less delightful than novel, and exhibit in a new phase that wonderful variety in the works of Nature, of which fresh instances occur at every step we take from the known to the unknown.

LIST 17.

Species of which the flowers expand between November and February :—

ALNUS VIRIDIS. The male catkins, which are large and copiously produced, begin to appear in autumn, and expand during winter, more or less early according to the mildness of the season, whilst the shorter and more globular female catkins are developed rather later.

ARBUTUS UNEDO. The flowers begin to expand in October, but generally hang on the tree in beautiful pendent racemes during the months of November and December.

CHIMONANTHUS FRAGRANS. This valuable shrub produces an abundance of its delightfully fragrant flowers from November to February. It thrives best against a wall, but being of slow growth, it requires to be well established before it will flower ; once, however, started into bloom it bears freely. Like many other winter flowers, the scent is faint in the open air, but is abundantly developed by warmth.

COLLETIA CRUCIATA. Its curiously (and almost grotesquely) winged stems are quite clothed from November to January with a multitude of pretty bell-shaped flowers. It is a rather tender shrub, and requires great attention in very frosty weather.

CORNUS MASCULA. Unless in very severe seasons, it expands its small yellow flowers, disposed in umbels, in January and February before the development of its leaves.

CORYLUS AVELLANA. The pretty catkins of the Hazel begin to show themselves in autumn, and in January, if a few mild days occur, swell and expand into blossom. At the same time, the small tufts of crimson stigmas exerted from the female flowers become visible, but are too minute to be seen without careful search.

CRATÆGUS OXYACANTHA, var. PRÆCOX. This is the celebrated Glastonbury Thorn, which is popularly supposed to flower on Christmas day. That it does so occasionally is certain ; but, though a winter-flowering tree, it depends on the prevailing temperature of the season whether its leaves and flowers expand a little before or a little after mid-winter. Generally, however, it is in January or February that the foliage and blossoms are produced, and their beauty is often sadly marred by sudden frosts or cutting easterly winds.

DAPHNE COLLINA. Its terminal tufts of pretty, pinkish, and very fragrant flowers, are produced in abundance from January to May. It forms a compact bush, and, considering that it is a native of South Italy, is surprisingly hardy.

DAPHNE MEZEREUM. There is a variety of this species, called the Autumnale, which blooms freely from November to March. The flowers are pinkish and very similar to the normal species, from which it chiefly differs in its time of flowering.

ERICA CARNEA (by some called the *GYPSOCALLIS CARNEA*). This pretty heath blooms profusely from December to February. The drooping unilateral racemes seem to defy frost or snow, and form a lovely contrast to the dark green foliage amongst which they lie.

ERICA CODONODES. This valuable species is supposed to be a variety

of the *E. arborea*, but it differs from it in several essential respects. However this may be, it is a beautiful heath, quite hardy, and produces an abundance of its pretty bell-shaped blossoms from December to February, utterly regardless of climatic conditions.

GARRYA ELLIPTICA. Imagine a fine-foliaged evergreen plant vigorously growing in the open air, which you shall find on Christmas day festooned with numerous strings of flowers disposed in catkins from 8 to 12 inches long, as luxuriant and fresh as though it were May-day! Such is the *Garrya elliptica*, which, if grown against a wall, will thrive well and provide you with its floral wreaths from December to March.

HAMAMELIS VIRGINICA. The Wych Hazel of our American brethren is a prettily shaped small tree, which bears a profusion of yellow flowers from October to February. The flowers are individually small, but, being abundant, they produce a very pleasing effect.

JASMINUM NUDIFLORUM. This beautiful yellow Jasmine produces its conspicuous flowers from November to February, and forms one of our handsomest winter shrubs. It requires a trellis or a wall on which to rest its long semi-pendulous shoots, which, whilst leafless, are lined with bright golden blossom.

LARDIZABALA BITERNATA. This fine-foliaged evergreen climbing shrub produces its long pendulous racemes of purple and brown flowers in December and January; and, though a native of Chili, it resists our winters very well, provided it is trained to a south wall.

RHODODENDRON DAURICUM. This shrub does not produce such large or showy flowers as most other Rhododendrons, but to compensate for this, it presents the peculiar feature of flowering from December to March,—a property which renders it a most desirable acquisition to the lovers of winter flowers.

VIBURNUM TINUS. This is the well-known Laurestine, which forms so conspicuous an ornament of our suburban gardens, and is none the less welcome for giving us its cheerful blossoms in the midst of winter. But it does more: its flowering season is protracted from December to April, so that it not only enlivens winter, but also embellishes spring.

CHAPTER FOURTH.

FLORAL CALENDAR, OR CLASSIFICATION OF SPECIES ACCORDING TO THE MONTHS IN WHICH THEY BLOSSOM—COLOUR TABLE, OR LISTS OF SPECIES PRODUCING FLOWERS OF THE SAME COLOUR.

IN the subjoined list (No. 18) are classified, according to the months in which they blossom, all such of the trees and shrubs described in this work as bear conspicuous flowers. Coniferous and amentaceous (catkin-bearing) trees are excluded, as also those of which the blossoms are inconspicuous, such as *Aucuba*, *Buxus*, etc. By a reference to this list, any person wishing to make a particular portion of his grounds gay with flowers at a particular season of the year; or else, so to assort his plants as to ensure a succession of bloom, will here find the materials for such purposes ready to his hand. As an additional furtherance to these objects, to each plant the colour of its flower is appended.

IN the construction of this floral calendar, literal accuracy is unattainable for the following reasons:—*Firstly*, The blossoms of a plant do not always, nor in all places, expand at the same period of the year. The range of variation extends from fourteen to thirty days (and occasionally even beyond that), depending on a diversity of circumstances—such as whether the season be mild or cold, or whether the place of growth be low or elevated, moist or dry, etc. etc. *Secondly*, Some plants remain but a short time in blossom, whilst in others the flowering process is continued for some months in succession. In the list here given, the month assigned to each plant as its period of bloom is that in which it first freely develops its flowers. *Thirdly*, There is some irregularity even in the

rotation of flowering of different species. For instance, in ordinary years, a species A comes into flower the latter end of April, and a species B about the beginning of May ; and accordingly, in our table, the flowering month assigned to A is April, and that to B is May. But in some seasons it will happen that B flowers late in April, and A early in May, thus, in cases of rare recurrence, reversing their relative periodicity. Without these explanations, our floral calendar might occasionally, under exceptional circumstances, be taxed with inaccuracy.

It must be noted that although (from the necessity of drawing some line of demarcation) all the species expanding their blossom during the course of a particular month have been alphabetically arranged under the head of that month, it does not follow that all these flower simultaneously, for some bloom early and others late in the same month. In Nature, all gradations are so imperceptibly and harmoniously blended that they baffle all attempts at exact artificial classification.

In ordinary seasons, some few plants blossom twice a year, such as *Andromeda floribunda*, *Wistaria sinensis*, *Weigelia amabilis*, etc., but their autumnal flowers are far less numerous and luxuriant than those produced in spring.

Of the 372 plants, the flowers of which are sufficiently conspicuous to justify admittance into this list—

13	flower in the winter months,
11	„ in March,
33	„ in April,
91	„ in May,
84	„ in June,
95	„ in July,
38	„ in August,
5	„ in September,
2	„ in October and November.

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Thus it appears that in the three months, May, June, and July, no less than 270 trees and shrubs display their floral beauties, whilst only 102 develop their blossoms during the remaining nine months of the year. It is also noticeable that a larger number of this class of plants expand their blossoms during the ungenial months of December, January, and February, than during the comparatively warm months of September, October, and November. This latter period, however, is compensated for this deficiency by an abundant supply of flowers from several herbaceous plants, such as the *Chrysanthemum*, *Aster*, *Gladiolus*, etc.

The period of the year when our shrubberies display the greatest profusion of simultaneous blossoms is July, as, in addition to the large number which are then first developed, many of the May and June flowering plants continue to furnish their contingent during the month of July. And, for a similar reason, the comparative contributions of August to our floral wealth must not be estimated from the diminished number of plants which open their flowers during that month (viz. 38 to 95 in July), as many of the species which commence their flowering season in June and July continue it during a considerable portion of August.

FLORAL CALENDAR.

Times of blooming (under the head of each month), and colours of blossoms of the more showy and abundantly flowering trees and shrubs described in this work.

LIST 18.

DECEMBER, JANUARY, and FEBRUARY.

<i>Chimonanthus fragrans</i> , yellowish.	<i>Daphne collina</i> , pale pink.
<i>Colletia cruciata</i> , pale yellow.	<i>Mezereum</i> , lilac.
<i>Cornus mascula</i> , yellow.	<i>Erica carnea</i> , pale purple.

DECEMBER, JANUARY, and FEBRUARY—*continued.*

<i>Erica codonodes</i> , yellowish white.	<i>Lardizabala biternata</i> , brownish
<i>Garrya elliptica</i> , yellowish green.	purple.
<i>Hamamelis Virginica</i> , yellow.	<i>Rhododendron Dauricum</i> , purple.
<i>Jasminum nudiflorum</i> , do.	<i>Viburnum tinus</i> , white.

MARCH.

<i>Akebia quinata</i> , dark pink.	<i>Forsythia suspensa</i> , yellow.
<i>Amygdalus communis</i> , pale rose.	<i>viridissima</i> , do.
<i>Berberis dulcis</i> , orange.	<i>Fothergilla alnifolia</i> , white.
<i>Cydonia Japonica</i> , scarlet.	<i>Hippophaë rhamnoides</i> , greenish.
<i>Daphne laureola</i> , green.	<i>Magnolia conspicua</i> , white.
<i>Rhododendron ciliatum</i> , pale rose.	

APRIL.

<i>Acer circinatum</i> , green and yellow.	<i>Daphne Pontica</i> , greenish yellow.
<i>eriocarpum</i> , do.	<i>Deutzia gracilis</i> , white.
<i>pseudoplatanus</i> , do.	<i>Dirca palustris</i> , yellow.
<i>rubrum</i> , red.	<i>Iberis sempervirens</i> , white.
<i>saccharinum</i> , yellow.	<i>Kerria Japonica</i> , yellow.
<i>Amelanchier botryapium</i> , white.	<i>Magnolia auriculata</i> , yellowish
<i>Amygdalus nana</i> , rose.	white.
<i>orientalis</i> , red.	<i>Magnolia purpurea</i> , purple.
<i>persica</i> , rose.	<i>Mahonia aquifolium</i> , yellow.
<i>Arbutus</i> <i>Andrachne</i> , greenish	<i>Japonica</i> , do.
white.	<i>Rhododendron arboreum niveum</i> ,
<i>procera</i> , do.	white.
<i>Arctostaphylos Uva-ursi</i> , white.	<i>Salix caprea</i> , yellow.
<i>Armeniaca vulgaris</i> , do.	<i>Skimmia laureola</i> , pale yellow.
<i>Camellia Japonica</i> , red.	<i>Vella pseudo-cytisus</i> , yellow.
<i>Cassandra calyculata</i> , white.	<i>Weigelia amabilis</i> , pale pink.
<i>Cerasus lauro-cerasus</i> , do.	rosea, do.
<i>vulgaris</i> , fl. pl., do.	<i>Xanthorrhiza apiifolia</i> , brown.

MAY.

<i>Acacia dealbata</i> , yellow.	<i>Acer Tataricum</i> , do.
<i>Acer campestre</i> , green and yellow.	<i>Æsculus glabra</i> , greenish-yellow.
<i>Lobelia</i> , do.	<i>hippocastanum</i> , white
<i>macrophyllum</i> , green.	dotted.
<i>Monspeulanum</i> , green and	<i>Ammyrsine buxifolia</i> , white.
yellow.	<i>Andromeda floribunda</i> , do.
<i>obtusatum</i> , do.	<i>Anthyllis barba-Jovis</i> , pale yellow.
<i>spicatum</i> , do.	<i>Azalea Pontica</i> , yellow.
<i>striatum</i> , do.	<i>Berberis Darwinii</i> , orange.

MAY—*continued.*

- Berberis stenophylla*, yellow.
Caragana arborescens, yellow.
 spinosa, do.
Cerasus depressa, white.
 Lusitanica, do.
 padus, do.
 semperflorens, do.
Cercis siliquastrum, pink.
Cornus florida, yellow and white.
Coronella Emerus, reddish yellow.
Cotoneaster frigida, white.
 microphylla, do.
 thymifolia, do.
Crataegus—all the 13 species, do.
Cydonia vulgaris, do.
Cytisus albus, do.
 laburnum, yellow.
Empetrum nigrum, purple.
Erica arborea, white.
Gaultheria Shallon, do.
Halesia, both species, do.
Halimodendron argenteum, purplish pink.
Ilex aquifolium, white.
Illicium religiosum, pale yellow.
Ledum palustre, white.
Magnolia tripetala, do.
Mahonia Nepalensis, yellow.
Ornus Europæa, greenish white.
Oxycoccus macrocarpus, white.
Pæonia Moutan, purplish white.
Paulownia imperialis, violet streaked.
Pavia rubra, red.
- Pernettya mucronata*, white.
Philadelphus coronarius, creamy white.
Polygala chamæbuxus, yellowish.
Prunus Sinensis, white.
 triloba, pinkish.
Pyrus aria, do.
 aucuparia, do.
 spectabilis, pinkish.
Raphiolepis ovata, white.
Rhododendron campanulatum, pale pink.
 chamæcistus, pale purple.
 Ponticum, purple.
Rhodora Canadensis, pale purple.
Ribes aureum, yellow.
 rubrum multiflorum, green.
 sanguineum, red.
 speciosum, do.
Rubus spectabilis, reddish purple.
Ruscus racemosus, greenish yellow.
Salix lanata, yellow.
 pentandra, do.
Sambucus racemosa, greenish yellow.
Skimmia Japonica, white.
Spiræa lævigata, do.
Syringa Emodi, purple.
 Persica, light purple.
 vulgaris, lilac.
Vaccinium corymbosum, whitish.
 vitis idæa, pale pink.
Wistaria Sinensis, bluish.

JUNE.

- Acer platanoides*, green and yellow.
Adenocarpus intermedius, yellow.
Æsculus rubicunda, red.
Aristolelia Macqui, greenish.
Azalea nudiflora, pink, variegated.
 procumbens, rose.
Berberis concinna, yellow.
Bignonia capreolata, scarlet.
- Buddlea globosa*, orange.
Calophaca Wolgarica, yellow.
Cassiope tetragona, white.
Castanea vesca, green.
Ceanothus azureus, blue.
Cerasus Virginiana, white.
Chionanthus Virginica, do.
Cistus Cyprius, do.

JUNE—*continued.*

- | | |
|-----------------------------------------------------|-------------------------------------------------|
| <i>Cistus laurifolius</i> , white. | <i>Menispermum Canadense</i> , greenish yellow. |
| <i>purpureus</i> , light purple. | <i>Menziesia globularis</i> , brown. |
| <i>Clematis florida</i> , white. | <i>Mespilus Germanica</i> , white. |
| <i>Colletia horrida</i> , greenish white. | <i>Nitraria Schoberi</i> , do. |
| <i>Cytisus alpinus</i> , yellow. | <i>Olea ilicifolia</i> , do. |
| <i>patens</i> , pale yellow. | <i>Ononis fruticosa</i> , reddish purple. |
| <i>Weldeni</i> , yellow. | <i>Osmanthus ilicifolius</i> , white. |
| <i>Deutzia scabra</i> , white. | <i>Panax horridum</i> , greenish white. |
| <i>Diervilla Canadensis</i> , yellow. | <i>Pavia Californica</i> , white. |
| <i>Elæagnus parvifolia</i> , greenish. | <i>discolor</i> , red and yellow. |
| <i>Erica Australis</i> , reddish purple. | <i>macrostachya</i> , white. |
| <i>tetralix</i> , pink. | <i>Philadelphus grandiflorus</i> , do. |
| <i>Escallonia illinita</i> , red. | <i>verrucosus</i> , do. |
| <i>macrantha</i> , pinkish red. | <i>Phlomis fruticosa</i> , yellow. |
| <i>Exochordia grandiflora</i> , white. | <i>Photinia serrulata</i> , white. |
| <i>Genista sagittalis</i> , yellow. | <i>Phyllococe taxifolia</i> , purple. |
| <i>triquetra</i> , do. | <i>Piptanthus Nepalensis</i> , yellow. |
| <i>Grabowskia Boerhaaviæfolia</i> , white streaked. | <i>Ptelea trifoliata</i> , green. |
| <i>Helianthemum canescens</i> , reddish crimson. | <i>Pyrus arbutifolia</i> , white. |
| <i>grandiflorum</i> , yellow. | <i>salicifolia</i> , do. |
| <i>hyssopifolium</i> , copper. | <i>torminalis</i> , do. |
| <i>Hydrangea hortensia</i> , pinkish white. | <i>Rhododendron Catawbiense</i> , purple. |
| <i>Ilex opaca</i> , white. | <i>ferrugineum</i> , rose. |
| <i>Illicium floridanum</i> , red. | <i>Robinia pseudacacia</i> , white. |
| <i>Kalmia angustifolia</i> , dark red. | <i>Rosa Banksiæ</i> , do. |
| <i>Leptospermum lanigerum</i> , white. | <i>rubiginosa</i> , pale pink. |
| <i>Ligustrum vulgare</i> , do. | <i>Serissa foetida</i> , white. |
| <i>Linnæa borealis</i> , pale pink. | <i>Spiræa arisæfolia</i> , do. |
| <i>Lonicera Japonica</i> , red. | <i>chamædrifolia</i> , do. |
| <i>Ledebourii</i> , reddish yellow. | <i>trilobata</i> , do. |
| <i>periclymenum</i> , pale yellow. | <i>Staphylea pinnata</i> , do. |
| <i>Magnolia acuminata</i> , yellowish white. | <i>trifolia</i> , do. |
| | <i>Syringa Josikæa</i> , purple. |
| | <i>Viburnum cotinifolium</i> , white. |
| | <i>macrocephalum</i> , do. |
| | <i>plicatum</i> , do. |

JULY.

- | | |
|-----------------------------------------------|-----------------------------------------------|
| <i>Amorpha fragrans</i> , purple. | <i>Azalea viscosa</i> , white. |
| <i>fruticosa</i> , do. | <i>Berberidopsis corallina</i> , crimson. |
| <i>Andromeda polifolia</i> , pink. | <i>Calycanthus floridus</i> , purplish brown. |
| <i>Aralia</i> , the three species, white. | <i>macrophyllus</i> , do. |
| <i>Aristolochia siphon</i> , brownish yellow. | <i>Catalpa syringæfolia</i> , white spotted. |
| <i>Atraphaxis spinosa</i> , whitish pink. | |

JULY—*continued.*

Ceanothus Americanus, white.	Lomatia longifolia, white.
intermedius, pale blue.	Lonicera b. aureo-reticulata, pale pink.
Cerasus Caroliniana, white.	confusa, yellowish white.
Clematis lanuginosa, light blue.	sempervirens, do. scarlet.
Colutea arborescens, yellow.	Lycium Europæum, pale pink.
Corema alba, white.	Lyonia arborea, white.
Cornus alba, do.	racemosa, do.
Cytisus purpureus, purple.	Magnolia glauca, do.
Dabæcia polifolia, do.	macrophylla, do.
Daphne cneorum, pink.	Malachodendron ovatum, yellowish white.
gnidium, pale pink.	Myricaria Germanica, rose-pink.
Elæagnus hortensis, yellowish green.	Myrtus communis, white.
reflexa, do.	Periploca Græca, brown.
Epigæa repens, white.	Polygonum vacciniifolium, pinkish.
Erica ciliaris, pale red.	Potentilla fruticosa, yellow.
multiflora, do.	Rhus cotinus, pale purple.
stricta, reddish purple.	typhina, greenish yellow.
Escallonia pterocladon, white.	Robinia hispida, pink.
Eugenia ugni, pale pink.	viscosa, pale pink.
Eurybia ilicifolia, white.	Rosa ferox, red.
Gaultheria procumbens, do.	sulphurea, yellow.
Genista radiata, yellow.	Santolina chamæcyparissus, yellow.
Gleditschia, all three species, green.	Spiræa bella, rose.
Gordonia pubescens, white.	callosa, do.
Gymnocladus Canadensis, do.	Lindleyana, white.
Helianthemum croceum, yellow.	opulifolia, do.
sulphureum, pale do.	salicifolia, do.
Hydrangea arborescens, white.	Stuartia Virginica, do.
quercifolia, do.	Styrax officinale, do.
Hypericum calycinum, yellow.	Tamarix Gallica, light pink.
hircinum, do.	Tecoma radicans, orange.
Indigofera decora, pinkish.	Thea viridis, white.
Itea Virginica, white.	Tilia, all the species, green.
Jasminum fruticans, yellow.	Tragopyrum lanceolatum, pinkish.
officinale, white.	Veronica decussata, bluish white.
revolutum, yellow.	Viburnum lentago, white.
Kalmia latifolia, pinkish white.	opulus sterile, do.
Kolreuteria paniculata, yellow.	Virgilia lutea, whitish.
Ligustrum Japonicum, white.	
Liriodendron tulipifera, yellow.	

AUGUST.

Acacia Julibrissin, white.	Asimina triloba, purple.
Aloysia citriodora, purplish white.	Benthamia fragifera, yellowish red.
Androsæmum officinale, yellow.	Berberis dealbata, yellow.

AUGUST—*continued.*

Bupleurum fruticosum, yellow.	Passiflora cærulea, bluish.
Calluna vulgaris, fl. pl., rose.	Punica granatum, scarlet.
Cephalanthus occidentalis, greenish yellow.	Rhus copallina, greenish yellow.
Cineraria maritima, yellow.	Rubus laciniatus, white.
Clematis flammula, white.	Nutkanus, do.
viticella, purple.	Ruta graveolens, yellow.
Desfontainea spinosa, scarlet.	Solanum jasminoides, pinkish white.
Desmodium penduliflorum, violet.	Sophora Japonica, cream.
Fontanesia phillyreoides, yellowish.	Spartium junceum, yellow.
Hydrangea nivea, white.	Symphoricarpus racemosus, reddish pink.
Hypericum Nepalense, yellow.	Veronica salicifolia, whitish.
Lavandula spica, lilac.	Vinca major, purple.
Leucothœ spinulosa, white.	Vitex agnus-castus, bluish white.
Leycesteria formosa, do.	Yucca, the three species, white.
Magnolia grandiflora, creamy white.	Zenobia sp. pulverulenta, do.

SEPTEMBER.

Clethra alnifolia, white.	Escallonia rubra, red.
tomentosa, do.	Hedera helix, green.
	Hibiscus Syriacus, purple.

OCTOBER.

Baccharis halimifolia, purplish white.

NOVEMBER.

Arbutus unedo, pinkish white.

COLOUR-TABLE.

In this section, the trees and shrubs enumerated in list No. 18 are re-distributed into groups of which the colour of their flowers is the ordinating principle. To those who can appreciate the striking effects which may be produced by a skilful combination of tints, through their harmony as well as through their contrasts, the utility of this colour-table will be sufficiently apparent. It is not only upon the relation between two flowers of different colours that taste has to adjudicate,

but also upon the relation between flower and foliage. The shades of colour, both of blossom and of leaf, and the combinations of which they are susceptible, are numberless, and offer the amplest scope for the exercise of good taste.

In analysing this list, we find that, of the 372 plants which it comprises, the proportions which the various colours of their flowers bear to each other are as follow:—

The flowers of 160 are white, or of kindred tints.

73 are yellow, orange, etc.

37 are blue, purple, violet, etc.

37 are pink, rose, etc.

33 are green or greenish.

25 are red or modifications of red, and

7 are brown.

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It will thus be seen that white is the largely predominant colour, and that white and yellow tints together constitute 63 per cent, or nearly two-thirds, of the entire 372 species. These two colours are precisely those which are most rarely exhibited in masses throughout nature. Blue and green occur profusely; the first in the vast vault of heaven, and the second in the wide-spread verdancy of trees and grass. Brown is also represented in the heather-clad moors, of which large patches are scattered over the surface of the earth. But white and yellow prevail over other colours only in the brilliant but evanescent floral developments of the vegetable world.

It is not only in the number of species that white flowers bear the sway. Some trees and shrubs are specially remarkable for the wonderful exuberance of their flowers, which, expanding simultaneously, convert the plant into one mass of gorgeous colour, and of these the greatest number are to be found amongst the white-flowering species. As instances of

such profuse bloomers may be cited *Magnolia conspicua*, *Amelanchier botryapium* (the snowy Mespilus), *Andromeda floribunda*, and several species of *Cerasus*, *Crataegus*, *Pyrus*, and *Prunus*. Of all these the flowers are white. Amongst the other colours, the plants which flourish most luxuriantly are the *Cytisus*, *Laburnum*, and the *Genistas* (yellow), the *Wistaria* (blue), the *Amygdalus* (pink), and the *Rhododendrons*, of which the colours are various. It may further be remarked that almost all the species which flower in large masses expand their blossoms in the early part of the year, and that here again the white-flowerers are remarkable as being amongst the very earliest.

LIST 19.

Plants of which the flowers are—

		WHITE, or nearly so.	
Yellowish white	.	<i>Erica codonodes</i>	. . . Winter.
White	. . .	<i>Viburnum tinus</i>	. . . "
"	. . .	<i>Fothergilla alnifolia</i>	. . . March.
"	. . .	<i>Mangolia conspicua</i>	. . . "
"	. . .	<i>Amelanchier botryapium</i>	. . . April.
Greenish white	.	<i>Arbutus Andrachne</i>	. . . "
"	" "	<i>procera</i>	. . . "
White	. . .	<i>Arctostaphylos uva-ursi</i>	. . . "
"	. . .	<i>Armeniaca vulgaris</i>	. . . "
"	. . .	<i>Cassandra calyculata</i>	. . . "
"	. . .	<i>Cerasus lauro-cerasus</i>	. . . "
"	. . .	<i>vulgaris fl. pl.</i>	. . . "
"	. . .	<i>Deutzia gracilis</i>	. . . "
"	. . .	<i>Iberis sempervirens</i>	. . . "
Yellowish white	.	<i>Magnolia auriculata</i>	. . . "
White	. . .	<i>Rhododendron arboreum niveum</i>	. . . "
White dotted	.	<i>Æsculus hippocastanum</i>	. . . May.
White	. . .	<i>Ammyrsine buxifolia</i>	. . . "
"	. . .	<i>Andromeda floribunda</i>	. . . { May (also sometimes in October).
"	. . .	<i>Cerasus depressa</i>	. . . May.
"	. . .	<i>Lusitanica</i>	. . . "
"	. . .	<i>padus</i>	. . . "

WHITE, etc.—*continued.*

White	<i>Cerasus semperflorens</i>	May.
"	<i>Cornus florida</i> (bracts)	"
"	<i>Cotoneaster frigida</i>	"
"	<i>microphylla</i>	"
"	<i>thymifolia</i>	"
"	<i>Cratægus</i> (the 13 species)	"
"	<i>Cydonia vulgaris</i>	"
"	<i>Cytisus albus</i>	"
"	<i>Erica arborea</i>	"
"	<i>Gaultheria Shallon</i>	"
"	<i>Halesia</i> (both species)	"
"	<i>Ilex aquifolium</i>	"
"	<i>Ledum palustre</i>	"
"	<i>Magnolia tripetala</i>	"
"	<i>Oxyoccus macrocarpus</i>	"
Purplish white	<i>Pæonia Moutan</i>	"
White	<i>Pernettya mucronata</i>	"
Creamy white .	<i>Philadelphus coronarius</i>	"
White	<i>Prunus Sinensis</i>	"
"	<i>Pyrus aria</i>	"
"	<i>aucuparia</i>	"
"	<i>Raphiolepis ovata</i>	"
"	<i>Skimmia Japonica</i>	"
"	<i>Spiræa lævigata</i>	"
Whitish	<i>Vaccinium corymbosum</i>	"
White	<i>Cassiope tetragona</i>	June.
"	<i>Cerasus Virginiana</i>	"
"	<i>Chionanthus Virginica</i>	"
"	<i>Cistus Cyprius</i>	"
"	<i>laurifolius</i>	"
"	<i>Clematis florida</i>	"
Greenish white	<i>Colletia horrida</i>	"
White	<i>Deutzia scabra</i>	"
"	<i>Exochordia grandiflora</i>	"
White streaked	<i>Grabowskia Boerhaaviaefolia</i>	"
Pinkish white .	<i>Hydrangea hortensia</i>	"
White	<i>Ilex opaca</i>	"
"	<i>Leptospermum lanigerum</i>	"
"	<i>Ligustrum vulgare</i>	"
Creamy white	<i>Magnolia acuminata</i>	"
White	<i>Mespilus Germanica</i>	"
"	<i>Nitraria Schoberi</i>	"
"	<i>Olea ilicifolia</i>	"
"	<i>Osmanthus ilicifolius</i>	"
Greenish white	<i>Panax horridum</i>	"
White	<i>Pavia Californica</i>	"

WHITE, etc.—*continued.*

White	<i>Pavia macrostachya</i>	June.
"	<i>Philadelphus grandiflorus</i>	"
"	<i>verrucosus</i>	"
"	<i>Photinia serrulata</i>	"
"	<i>Pyrus arbutifolia</i>	"
"	<i>salicifolia</i>	"
"	<i>torminalis</i>	"
"	<i>Robinia pseudacacia</i>	"
"	<i>Rosa Banksiæ</i>	"
"	<i>Serissa foetida</i>	"
"	<i>Spiræa arisæfolia</i>	"
"	<i>chamædrifolia</i>	"
"	<i>trilobata</i>	"
"	<i>Staphylea pinnata</i>	"
"	<i>trifolia</i>	"
"	<i>Viburnum cotinifolium</i>	"
"	<i>macrocephalum</i>	"
"	<i>plicatum</i>	"
"	<i>Aralia</i> (all three species)	July.
"	<i>Azalea viscosa</i>	"
White spotted	<i>Catalpa syringæfolia</i>	"
White	<i>Ceanothus Americanus</i>	"
"	<i>Cerasus Caroliniana</i>	"
"	<i>Corema alba</i>	"
"	<i>Cornus alba</i>	"
"	<i>Epigæa repens</i>	"
"	<i>Escallonia pterocladon</i>	"
"	<i>Eurybia ilicifolia</i>	"
"	<i>Gaultheria procumbens</i>	"
"	<i>Gordonia pubescens</i>	"
"	<i>Gymnocladus Canadensis</i>	"
"	<i>Hydrangea arborescens</i>	"
"	<i>quercifolia</i>	"
"	<i>Itea Virginica</i>	"
"	<i>Jasminum officinale</i>	"
Pinkish white	<i>Kalmia latifolia</i>	"
White	<i>Ligustrum Japonicum</i>	"
"	<i>Lomatia longifolia</i>	"
Yellowish white	<i>Lonicera confusa</i>	"
White	<i>Lyonia arborea</i>	"
"	<i>racemosa</i>	"
"	<i>Magnolia glauca</i>	"
"	<i>macrophylla</i>	"
Yellowish white	<i>Malachodendron ovatum</i>	"
White	<i>Myrtus communis</i>	"
"	<i>Spiræa Lindleyana</i>	"

WHITE, etc.—*continued.*

White	<i>Spiræa opulifolia</i>	July.
"	<i>salicifolia</i>	"
"	<i>Stuartia Virginica</i>	"
"	<i>Styrax officinale</i>	"
"	<i>Thea viridis</i>	"
Bluish white	<i>Veronica decussata</i>	"
White	<i>Viburnum lentago</i>	"
"	<i>opulus sterile</i>	"
Whitish	<i>Virgilia lutea</i>	"
White	<i>Acacia Julibrissin</i>	August.
Purplish white	<i>Aloysia citriodora</i>	"
White	<i>Clematis flammula</i>	"
Yellowish white	<i>Fontanesia phillyreoides</i>	"
White	<i>Hydrangea nivea</i>	"
"	<i>Leucothoë spinulosa</i>	"
"	<i>Leycesteria formosa</i>	"
Creamy white	<i>Magnolia grandiflora</i>	"
White	<i>Rubus laciniatus</i>	"
"	<i>Nutkanus</i>	"
Pinkish white	<i>Solanum jasminoides</i>	"
Creamy white	<i>Sophora Japonica</i>	"
Whitish	<i>Veronica salicifolia</i>	"
Bluish white	<i>Vitex agnus castus</i>	"
White	<i>Yucca (the three species)</i>	"
"	<i>Zenobia speciosa pulverulenta</i>	"
"	<i>Clethra alnifolia</i>	September.
"	<i>tomentosa</i>	"
Purplish white	<i>Baccharis halimifolia</i>	October.
Pinkish white	<i>Arbutus unedo</i>	November.

YELLOW, ORANGE, etc.

Yellowish	<i>Chimonanthus fragrans</i>	Winter.
Pale yellow	<i>Colletia cruciata</i>	"
Yellow	<i>Cornus mascula</i>	"
"	<i>Hamamelis Virginica</i>	"
"	<i>Jasminum nudiflorum</i>	"
Orange	<i>Berberis dulcis</i>	March.
Yellow	<i>Forsythia suspensa</i>	"
"	<i>viridissima</i>	"
Greenish yellow	<i>Acer saccharinum</i>	April.
Yellow	<i>Dirca palustris</i>	"
"	<i>Kerria Japonica</i>	"
"	<i>Mahonia aquifolium</i>	"
"	<i>Japonica</i>	"
"	<i>Salix caprea</i>	"

YELLOW, ORANGE, etc.—*continued.*

Pale yellow . . .	Skimmia laureola . . .	April.
Yellow . . .	Vella pseudo-cytisus . . .	"
" . . .	Acacia dealbata . . .	May.
Greenish yellow . . .	Æsculus glabra . . .	"
Pale yellow . . .	Anthyllis barba-Jovis . . .	"
Yellow . . .	Azalea Pontica . . .	"
Orange . . .	Berberis Darwinii . . .	"
Yellow . . .	stenophylla . . .	"
" . . .	Caragana arborescens . . .	"
" . . .	spinosa . . .	"
Reddish yellow . . .	Coronilla Emerus . . .	"
Yellow . . .	Cytisus laburnum . . .	"
Pale yellow . . .	Illicium religiosum . . .	"
Yellow . . .	Mahonia Nepalensis . . .	"
Yellowish . . .	Polygala chamæbuxus . . .	"
Yellow . . .	Ribes aureum . . .	"
Greenish yellow . . .	Ruscus racemosus . . .	"
Yellow . . .	Salix lanata . . .	"
" . . .	pentandra . . .	"
Greenish yellow . . .	Sambucus racemosa . . .	"
Yellow . . .	Adenocarpus intermedius . . .	June.
" . . .	Berberis concinna . . .	"
Orange . . .	Buddleia globosa . . .	"
Yellow . . .	Calophaca Wolgarica . . .	"
" . . .	Cytisus alpinus . . .	"
" . . .	Weldeni . . .	"
Pale yellow . . .	patens . . .	"
Yellow . . .	Diervilla Canadensis . . .	"
" . . .	Genista sagittalis . . .	"
" . . .	triquetra . . .	"
" . . .	Helianthemum grandiflorum . . .	"
Reddish yellow . . .	Lonicera Ledebourii . . .	"
Pale yellow . . .	periclymenum . . .	"
Greenish yellow . . .	Menispermum Canadense . . .	"
Red and yellow . . .	Pavia discolor . . .	"
Yellow . . .	Phlomis fruticosa . . .	"
" . . .	Piptanthus Nepalensis . . .	"
" . . .	Colutea arborescens . . .	July.
" . . .	Genista radiata . . .	"
" . . .	Helianthemum croceum . . .	"
Pale yellow . . .	sulphureum . . .	"
Yellow . . .	Hypericum calycinum . . .	"
" . . .	hircinum . . .	"
" . . .	Jasminum fruticans . . .	"
" . . .	revolutum . . .	"
" . . .	olreuteria paniculata . . .	"

YELLOW, ORANGE, etc.—*continued.*

Yellow . . .	Liriodendron tulipifera . . .	July.
" . . .	Potentilla fruticosa . . .	"
Greenish yellow . . .	Rhus typhina . . .	"
Yellow . . .	Rosa sulphurea . . .	"
" . . .	Santolina chamæcyparissus . . .	"
Orange . . .	Tecoma radicans . . .	"
Yellow . . .	Androsæmum officinale . . .	August.
" . . .	Berberis dealbata . . .	"
" . . .	Bupleurum fruticosum . . .	"
" . . .	Cineraria maritima . . .	"
" . . .	Hypericum Nepalense . . .	"
" . . .	Ruta graveolens . . .	"
" . . .	Spartium junceum . . .	"

BLUE, PURPLE, VIOLET, LILAC, etc.

Lilac . . .	Daphne mezereum . . .	Winter.
Pale purple . . .	Erica carnea . . .	"
Purple . . .	Rhododendron Dauricum . . .	"
Dark purple . . .	Akebia quinata . . .	March.
Purple . . .	Magnolia purpurea . . .	April.
" . . .	Empetrum nigrum . . .	May.
Violet streaked . . .	Paulownia imperialis . . .	"
Pale purple . . .	Rhododendron chamæcistus . . .	"
Purple . . .	Ponticum . . .	"
Pale purple . . .	Rhodora Canadensis . . .	"
Reddish purple . . .	Rubus spectabilis . . .	"
Purple . . .	Syringa Emodi . . .	"
Light purple . . .	Persica . . .	"
Lilac . . .	vulgaris . . .	"
Bluish . . .	Wistaria Sinensis . . .	"
Blue . . .	Ceanothus azureus . . .	June.
Light purple . . .	Cistus purpureus . . .	"
Reddish purple . . .	Erica Australis . . .	"
" . . .	Ononis fruticosa . . .	"
Purple . . .	Phyllodoce taxifolia . . .	"
" . . .	Rhododendron Catawbiense . . .	"
" . . .	Syringa Josikæa . . .	"
" . . .	Amorpha fragrans . . .	July.
" . . .	fruticosa . . .	"
Pale blue . . .	Ceanothus intermedius . . .	"
" . . .	Clematis lanuginosa . . .	"
Purple . . .	Cytisus purpureus . . .	"
" . . .	Dabæcia polifolia . . .	"
Reddish purple . . .	Erica stricta . . .	"
Pale purple . . .	Rhus cotinus . . .	"

BLUE, PURPLE, VIOLET, LILAC, etc.—*continued.*

Purple	Asimina triloba	August.
"	Clematis viticella	"
Violet	Desmodium penduliflorum	"
Lilac	Lavandula spica	"
Bluish	Passiflora cœrulea	"
Purple	Vinca major	"
"	Hibiscus Syriacus	September.

PINK, ROSE, etc.

Pale pink	Daphne collina	Winter.
Pale rose	Amygdalus communis	March.
"	Rhododendron ciliatum	"
Rose	Amygdalus nana	April.
"	Persica	"
Pale pink	Weigelia amabilis	"
"	rosea	"
"	Cercis siliquastrum	May.
Purplish pink	Halimodendron argenteum	"
Pale pink	Prunus triloba	"
Pinkish	Pyrus spectabilis	"
Pale pink	Rhododendron campanulatum	"
" "	Vaccinium vitis-idaea	"
Pink variegated	Azalea nudiflora	June.
Rose	procumbens	"
Pink	Erica tetralix	"
Pale pink	Linnaea borealis	"
Rose	Rhododendron ferrugineum	"
Pale pink	Rosa rubiginosa	"
Pink	Andromeda polifolia	July.
Pale pink	Atraphaxis spinosa	"
Pink	Daphne cneorum	"
Pale pink	gnidium	"
" "	Eugenia Ugni	"
Pinkish	Indigofera decora	"
Pale pink	Lonicera b. aureo-reticulata	"
" "	Lycium Europæum	"
Rose	Myricaria Germanica	"
Pinkish	Polygonum vacciniifolium	"
Pink	Robinia hispida	"
Pale pink	viscosa	"
Rose	Spiræa bella	"
"	callosa	"
Pale pink	Tamarix Gallica	"
Pinkish	Tragopyrum lanceolatum	"
Rose	Calluna vulgaris, fl. pl.	August.
Reddish pink	Symphoricarpus racemosus	"

GREEN, etc.

Yellowish green	. <i>Garrya elliptica</i>	. . .	Winter.
Green	. . . <i>Daphne laureola</i>	. . .	March.
Greenish	. . . <i>Hippophaë rhamnoides</i>	. . .	"
Yellowish green	. <i>Acer circinatum</i>	. . .	April.
"	" . . . <i>eriocarpum</i>	. . .	"
"	" . . . <i>pseudoplatanus</i>	. . .	"
"	" . . . <i>Daphne Pontica</i>	. . .	"
"	" . . . <i>Acer campestre</i>	. . .	May.
"	" . . . <i>Lobelia</i>	. . .	"
Green	. . . <i>macrophyllum</i>	. . .	"
Yellowish green	. <i>Monspeulanum</i>	. . .	"
"	" . . . <i>obtusatum</i>	. . .	"
"	" . . . <i>spicatum</i>	. . .	"
"	" . . . <i>striatum</i>	. . .	"
"	" . . . <i>Tataricum</i>	. . .	"
Greenish	. <i>Ornus Europæa</i>	. . .	"
Green	. . . <i>Ribes rubrum multiflorum</i>	. . .	"
Yellowish green	. <i>Acer platanoides</i>	. . .	June.
Greenish	. . . <i>Aristotelia Macqui</i>	. . .	"
Green	. . . <i>Castanea vesca</i>	. . .	"
Greenish	. . . <i>Elæagnus parvifolia</i>	. . .	"
Green	. . . <i>Ptelea trifoliata</i>	. . .	"
Yellowish green	. <i>Elæagnus hortensis</i>	. . .	July.
"	" . . . <i>reflexa</i>	. . .	"
Green	. . . <i>Gleditschia</i> (all three species)	. . .	"
"	. . . <i>Tilia</i> (all the species)	. . .	"
Yellowish green	. <i>Cephalanthus occidentalis</i>	. . .	August.
"	" . . . <i>Rhus copallina</i>	. . .	"
Green	. . . <i>Hedera helix</i>	. . .	September.

RED, SCARLET, CRIMSON, COPPER, etc.

Scarlet	. . . <i>Cydonia Japonica</i>	. . .	March.
Red	. . . <i>Acer rubrum</i>	. . .	April.
"	. . . <i>Amygdalus orientalis</i>	. . .	"
"	. . . <i>Camellia Japonica</i>	. . .	"
"	. . . <i>Pavia rubra</i>	. . .	May.
"	. . . <i>Ribes sanguineum</i>	. . .	"
"	. . . <i>speciosum</i>	. . .	"
"	. . . <i>Æsculus rubicunda</i>	. . .	June.
Scarlet	. . . <i>Bignonia capreolata</i>	. . .	"
Red	. . . <i>Escallonia illinita</i>	. . .	"
Pinkish red	. . . <i>macrantha</i>	. . .	"
Reddish crimson	. <i>Helianthemum canescens</i>	. . .	"
Copper	. . . <i>hyssopifolium</i>	. . .	"
Red	. . . <i>Illicium Floridanum</i>	. . .	"

RED, SCARLET, CRIMSON, COPPER, etc.—*continued.*

Dark red . . .	<i>Kalmia augustifolia</i> . . .	June.
Red . . .	<i>Lonicera Japonica</i> . . .	"
Crimson . . .	<i>Berberidopsis corallina</i> . . .	July.
Pale red . . .	<i>Erica ciliaris</i> . . .	"
" " . . .	<i>multiflora</i> . . .	"
Yellowish scarlet . . .	<i>Lonicera sempervirens</i> . . .	"
Red . . .	<i>Rosa ferox</i> . . .	"
Yellowish red . . .	<i>Benthamia fragifera</i> . . .	August.
Scarlet . . .	<i>Desfontainea spinosa</i> . . .	"
" . . .	<i>Punica granatum</i> . . .	"
Red . . .	<i>Escallonia rubra</i> . . .	September.

BROWN, etc.

Purplish brown . . .	<i>Lardizabala biternata</i> . . .	Winter.
Brown . . .	<i>Xanthorrhiza apiifolia</i> . . .	April.
" . . .	<i>Menziesia globularis</i> . . .	June.
Yellowish brown . . .	<i>Aristolochia siphon</i> . . .	July.
Purplish brown . . .	<i>Calycanthus floridus</i> . . .	"
" . . .	<i>macrophyllus</i> . . .	"
Brown . . .	<i>Periploca Græca</i> . . .	"

CHAPTER FIFTH.

CLASSIFICATION OF SPECIES INTO GROUPS WITH REFERENCE TO THEIR FRUIT—SPECIES BEARING EDIBLE FRUIT—SPECIES BEARING ORNAMENTAL FRUIT.

IN this chapter are collected, but in two separate lists—1st, Those species which bear edible fruit ; and 2d, Those of which the fruit is merely ornamental.

Of the species bearing edible fruit, it will be borne in mind that those alone are inserted in the list which are at the same time generally ornamental, so that there are many fruit-trees, with their numerous varieties, which do not find a place in this collection. The finest fruits are in reality artificial monstrosities,—the creations of horticultural science,—of processes in which every consideration is overlooked save that of elaborating the seed-bearing organ—viz. the fruit. The foliage, flowers, and shape of a fruit-tree are held of no account ; it is to the size, flavour, and symmetry of the fruit that the efforts of the grower are directed, and to those everything else is sacrificed. This hypertrophy of the one organ is detrimental to the development of the rest, as the Strasburg process of promoting the “foie gras” is detrimental to the goose. Amongst the multitudes of improved varieties of apple, pear, peach, and other fruit-trees which furnish such gratification to our palate, there are few which minister to any other of our senses besides that of taste.

The species bearing ornamental fruit are more numerous and are mostly very attractive, especially during winter, as berries are generally very persistent, and (less the toll exacted

by the birds, which no one would grudge them) last on the trees till spring. Several of these berries are innocuous, but either insipid or unpalatable, whilst others are unwholesome, or even poisonous; and in the doubt, it is best to abstain from all. The adventurous person who may neglect that caution,—“Pomaque non notis legit ab arboribus,”—may have occasion to repent his love of experiment.

The size of the fruit is frequently quite disproportionate to the size of the tree, as Lafontaine's fable of the Oak and the Gourd appositely illustrates. The berry of the small creeping *Gaultheria procumbens* is larger than that of the Mountain Ash, and of many other trees 20 or 30 feet high. But it is in the relative size of the seeds that this apparent anomaly is most strikingly revealed. A single bean or lupine outweighs 100,000 seeds of the Rhododendron or *Kalmia*. The seed of the *Paulownia imperialis*, which grows to the height of 50 feet; which, when young, sends forth annual shoots 6 to 8 feet in length and 3 inches in circumference, with leaves as large as those of a cabbage, has the appearance of a grain of dust. On this subject Sir Thomas Browne remarks in his quaint fashion—“The exiguity of some seeds extending to large productions is one of the magnalities of Nature, somewhat illustrating the work of the creation, and vast production from nothing.”

The comparative abundance and vitality of the seeds of certain plants are also topics which offer ample scope for observation and inference. How far these are connected with the longevity,—hardiness,—more or less extensive geographical distribution,—capability of reproduction from suckers, etc.,—liability to sudden destruction from climatic causes, etc. etc.,—of the respective species which the seeds are intended to reproduce, are very suggestive and interesting inquiries, which we must be content, in this work, with merely indicating as well worthy of special research.

LIST 20.

Species bearing edible fruit :—

ASMINA TRILOBA, the Papaw. It bears large yellowish fruit, of an oval shape, not very palatable to Europeans, and very rarely produced in this country.

BENTHAMIA FRAGIFERA. The fruit much resembles a large mulberry, but is by no means of an equally grateful flavour.

BERBERIS DULCIS. Most of the Berberries are edible and of a more or less agreeable flavour, but the fruit of the *B. dulcis* is at present considered the best. Have we not too much neglected this genus as a fruit-bearer? High cultivation and hybridisation would probably contribute some valuable additions to our garden fruits. A small proportion of the trouble we have taken to transmute the crab into the Golden Pippin might promote the improved Berberry to the honour of a place amongst our dessert fruits.

CARYA ALBA and **OLIVÆFORMIS**. These produce the hickory-nut of the Americans, the kernel of which affords sustenance to many tribes of native Indians, and is very relishing to those who are fond of nuts.

CASTANEA VESCA. This is the well-known Chestnut, which in Spain and the south of France affords food to large numbers, and in England is, when roasted, a delicacy. In our climate the fruit is rarely developed to its full maturity, although some varieties, such as "Downton's prolific," approach near to it in favourable seasons.

CELTIS AUSTRALIS. The fruit of the Nettle-tree is small, but of an agreeable flavour, and is considered very wholesome.

CORYLUS AVELLANA (the Hazel or Filbert). Even the common Hazel, which our hedges so plentifully supply, is a favourite fruit, but some of the improved varieties produce nuts of a delicious flavour and of a large size, and yield highly remunerative crops to the cultivators.

CRATÆGUS. All the species (and very numerous they are) of the Thorn yield berries in abundance, but the flavour of most of them is insipid or unpleasant. The *C. coccinea* and *tanacetifolia*, however, bear eatable fruit, and were these species carefully cultivated and improved with a view to develop their fruit-bearing capabilities, the result might probably fully repay the trouble.

CYDONIA VULGARIS. The Quince ought to be more freely cultivated, not only as an elegant flowering tree, but also for its fruit, which

is delightfully fragrant, and when mixed with apples in tarts imparts to them its very peculiar, and to some very grateful flavour. The *Cydonia Japonica* also fruits with us in favourable seasons, but though fragrant, the pome is too astringent to be agreeable.

DIOSPYROS LOTUS. This is the Date Plum of Eastern Europe, as the *D. Virginiana* is the Persimon of the Americans. The fruit of the former is yellow, and resembles the cherry in form and size. The Persimon is rather larger and of a reddish colour. Neither is very palatable when uncooked, but both make a very good conserve.

ELÆAGNUS ARGENTEA. This is the Wild Olive of the northern parts of America, bearing a fruit of an ovate form, of the size of a sloe, the pulp of which is rather too dry to suit many palates. It would no doubt be susceptible of improvement under cultivation.

EMPETRUM NIGRUM, the Crowberry. One of the few fruits of the extreme north of Europe. The berries are borne in clusters; individually they are very small, but they abound in a black juice agreeably acid, and make excellent tarts.

EPHEDRA DISTACHYA. This curious, rush-like, almost leafless shrub, bears berries in the early part of the summer, which are of a pleasant and somewhat acid flavour, and quite wholesome. Few have tasted them in this country, as the shrub is a rare one, of slow growth, and does not fruit abundantly.

EUGENIA UGNI. In its native country this shrub bears an abundance of berries, somewhat resembling those of a black currant, and of an agreeable aromatic flavour. In our climate its growth is checked, and its fertility much diminished, by the absence of the cloudless sky and bright sun-rays of the Chilian mountain-slopes, to which it is indigenous.

FIGUS CARICA. We may fairly place our old favourite the Fig-tree amongst the fruit-bearing tribe, although in this climate it is only in the southern counties (unless under exceptional circumstances or in exceptional seasons) that it yields its luscious produce. It will frequently be found to thrive best in odd corners, where things of more pretension and less value would (as it were) feel it an indignity to be planted.

GAULTHERIA PROCUMBENS and **SHALLOON.** Both these pretty but unpretending shrubs produce an abundance of berries (the former red, and the latter dark purple), which are wholesome, and, after undergoing culinary processes, either as preserves or in tarts, are very tasteful.

JUGLANS REGIA. What fruit is a more general favourite with both rich

and poor than the Walnut ? It matures at a season when the more luscious pulpy summer fruits have disappeared, and then becomes a standing dish. Post-prandial walnut-picking evokes meditation when we are solitary, or provokes discussion when we are many. The Walnut is a noble tree, which only produces fruit when of a considerable size, but then produces it abundantly. Why should it be so seldom planted ? Our ancestors better appreciated its value, and it figured largely in their gardens and plantations.

MESPILUS GERMANICA. Fruit-eaters are divided into two distinct classes—those who are not at all fond, and those who are exceedingly fond of the medlar. It has a very peculiar flavour, and, like olives or truffles, it is either enthusiastically relished or vehemently disliked.

MORUS NIGRA and RUBRA. The delicious and wholesome Mulberry deserves far more extensive culture than it now receives. Of the two species the *M. nigra* is preferable, but both produce fine fruit. The appreciation of this fine tree seems to have so much diminished that old specimens are much more numerous than the young trees appointed to succeed them, so that as the old trees die off, mulberries seem destined to get scarcer instead of more plentiful than they used to be. Probably one reason why our ancestors planted the tree more copiously was the idea (which they entertained, but which we have abandoned) that in this climate the labours of the silkworm could be utilised.

OXYCOCUS MACROCARPUS. This near ally to the common Cranberry is imported largely from America ; and whilst it is one of the most graceful of trailers, and one of the most elegant of the Ericaceæ as a flower-bearer, it at the same time ministers to our gastronomic requirements. Unfortunately, it will only thrive in bogs and swamps, which the extension of agricultural improvements is year after year extirpating.

PINUS PINEA ; the Stone Pine, of which the seeds are largely consumed as human food in Italy, where this tree abundantly flourishes. When growing in congenial soil and climate it furnishes large quantities of its pleasantly-flavoured seeds, which are copiously offered for sale in every market-town of South Italy. The seeds of the *Pinus Cembra* are likewise edible, but less esteemed than the produce of the Stone Pine.

PUNICA GRANATUM. It is indeed quite a rarity for a pomegranate to ripen in the open air in this climate ; but as such a phenomenon has been witnessed, and as, in favourable seasons, many plants unpro-

tected but in warm spots nearly mature fruit, it may not be deemed wrong to class this interesting plant under the head of fruit-trees. In a cool greenhouse it perfects both flower and fruit, but it is perhaps more interesting when grown as a half-hardy flowering shrub.

RIBES AUREUM. The family of the currants does not in many instances combine the "utile" and the "dulce." Those species and varieties, of which the fruit is most agreeable, are by no means remarkable for elegant habit or attractive blossoms. On the other hand, the more ornamental species bear as a rule only small, tasteless, and in some instances disagreeably-tasted berries. The *R. aureum*, however, is a species in which very pretty yellow flowers are succeeded by very agreeable yellow fruit.

RUBUS. All the three species of Bramble described bear edible fruit, but none of them much surpass in that respect the common Blackberry (*R. fruticosus*), that universal favourite of men and children, and hardy denizen of every hedge in England. Would it not be possible to improve the Blackberry both in size and flavour? A mural crown and a bag of sovereigns ought to be the guerdon of the man who accomplished this.

SALISBURIA ADIANTIFOLIA. This tree in China and Japan is chiefly grown for the sake of its fruit, which, although devoid of much flavour, is said to be wholesome, and, when roasted, very similar to that of maize treated in the same manner.

SHEPHERDIA ARGENTEA produces scarlet berries of about the size of a black currant, which are eatable, and said to be of an agreeable flavour.

VACCINIUM CORYMBOSUM and **VITIS IDÆA** both bear berries abundantly, which, for tarts, preserves, etc., are highly esteemed, as being both wholesome and agreeable to the taste. The species found most abundantly in our woods, etc., is the *V. myrtillus*, which bears the fruit known as whortleberries or bilberries.

LIST 21.

Plants bearing ornamental fruit:—

ACER SPICATUM. Fruit in keys, in erect racemes, tinged with red, making a very handsome show.

ALNUS VIRIDIS. Abundant catkins, of which the male are long, pendulous, and soon fall; and the female are oval and persistent.

ARBUTUS UNEDO (and to some extent the other species). Fruit similar in colour and shape to a strawberry, but rather smaller. The resemblance is, however, confined to outward appearances, as the flesh is dry and the flavour poor. It is highly ornamental when abundant.

AUCUBA JAPONICA. Berries in clusters, large, ovate, bright red, very smooth. When our fine old female specimens become fertilised by an admixture of the male plants, only recently introduced, we may anticipate that our admiration of their fine foliage will be enhanced by their production, in addition, of beautiful berries.

BERBERIS STENOPHYLLA. The arcuated branches, after being studded with elegant blossoms, become loaded with fine, purple, powder-encrusted berries, which hang gracefully from the underside of the semi-pendulous branches.

CATALPA SYRINGÆFOLIA. Pendulous, cylindrical pods, nearly a foot long, which hang on the tree nearly all the winter.

CERASUS PADUS. The Bird-cherry fruits copiously in pretty pendulous clusters, but birds greedily devour them very early in winter.

COLUTEA ARBORESCENS. The inflated legumes of the Bladder Senna are not only very curious and interesting in their structure, but hang in graceful clusters till far into winter.

COREMA ALBA. The white Portuguese crowsberry, differing from the *Empetrum nigrum* only in the colour of the berries and in its being an inhabitant of a warm instead of a cold climate.

CORNUS ALBA : Berries white. **C. MASCULA** : Berries scarlet. Both very ornamental.

COTONEASTER. All the three species produce an abundance of bright red berries, which last throughout winter, and form pretty contrasts with the small but dense evergreen foliage.

CRATÆGUS. All the species are very prolific in fine berries, of a red or scarlet colour, except the *C. Aronia*, *Mexicana*, *parvifolia*, *tanacetifolia*, and one or two varieties of the *oryacantha*, of which the berries are yellow or greenish. The largest in size is the fruit of the *C. Mexicana*, and the greatest abundance is produced by the *C. Pyracantha*.

CUPRESSUS LAWSONIANA. This magnificent cypress not only excels all its congeners in elegance of foliage and habit, but also in the beauty and abundance of its fruit. Even while yet small, it is covered, in ordinarily favourable seasons, with myriads of berries

which are sprinkled over with a fine glaucous bloom, and which, by their weight, render the branchlets (naturally pendulous) still more drooping and depressed.

ELÆAGNUS PARVIFOLIA. Berries small but very abundant, of a silver-grey colour, which, however, do not remain on the tree long, but drop even before the leaves.

EUONYMUS EUROPÆUS and **LATIFOLIUS.** The fruit is peculiarly formed, the capsule being rose-pink, and the fruit exerted from it being bright orange. The contrast between the two is most striking, and the colours are sufficiently vivid to be seen at some distance.

HIPPOPHÆ RHAMNOIDES. Berries bright orange, produced in tolerable abundance on the female plant, and contrasting prettily with the glaucous foliage.

ILEX AQUIFOLIUM. The universal appreciation of the beauty of Holly-berries, as they nestle under the dark-green leaves, renders all remark unnecessary; but it may be added that, in some varieties of the holly, the berries, when mature, are of a greenish, yellow, or whitish colour.

JUNIPERUS COMMUNIS. The berries of the juniper-tree are pretty, of a purple colour, covered with bloom, very persistent, but are not always plentifully produced. Other species also bear berries similar in appearance, but still more sparingly brought forth.

LEPTOSPERMUM LANIGERUM. This pretty and curious member of the Myrtle family has its branches and twigs lined with sessile round nuts, which are so persistent that the ensuing year's flowers find them unmoved, and the produce of both years' fruit and flowers adorns the shrub at the same time.

LEYCESTERIA FORMOSA. Purple berries, embedded in large bracts, of nearly the same colour, form more prominent objects than the flowers themselves, whilst at the same time they are more lasting.

LIGUSTRUM VULGARE. The pretty clusters of purple berries borne by the common privet are a well-known ornament to the shrub in autumn and winter.

MACLURA AURANTIACA. This is called the Osage Orange in America, and the appearance of the fruit when mature fully accounts for the name. Unfortunately the tree is rarely fertile in our climate, and it is seldom that our sight is regaled by a view of this elegant fruit.

MAGNOLIA. All the species bear fruit of a curious and interesting aspect, but the *M. acuminata* and *tripetala* are most noteworthy in

this respect, as being most prolific in our climate and most ornamental in fructification. The seeds, when they ripen, which does not often occur in our climate, hang out from the receptacle by a slender thread, and form a beautiful object. The fruit of the *M. acuminata*, when still unripe, bears some resemblance to a small cucumber, whence it is in America called the Cucumber-tree.

MAHONIA. All three species bear abundant clusters of fine, luscious, purple berries, powdered over with a glaucous bloom. Those of the *M. Japonica* are perhaps the handsomest, but they are all exceedingly ornamental.

OSTRYA VULGARIS. Its drooping persistent catkins, copiously furnished with large green bracts, hang gracefully pendent, and, from their resemblance to the fruit of the Hop, the tree is called the Hop Hornbeam.

PALIURUS ACULEATUS. The fruit is small, but of a curious shape, and from its peculiar form it is called by the French "Porte-chapeau."

PERNETTYA MUCRONATA. This elegant native of the dreary shores of the Straits of Magellan is loaded in winter with beautiful scarlet berries, which are very large as compared with the size of the shrub.

PINUS MACROCARPA. All the pines bear cones, which are more or less ornamental, but those of the *P. macrocarpa* merit special mention on account of their size and their spiny scales. They are upwards of one foot in length, and frequently weigh from 3 to 4 pounds each, so that they form noble objects when hanging from the lofty branches.

PLATANUS. The black balls which hang so gracefully, and in winter so prominently, from the branches of the Plane tree, are globular catkins, which, when winter is over, dehisce (open) and suffer the seeds to fall. Both the species bear fruit, but that of the *P. occidentalis* is the largest.

POPULUS MONILIFERA. This species of Poplar bears numerous and large catkins, which, when ripe, emit the cottony seed in such abundance as to strew the ground beneath with them as thick as flakes of snow; so much so, that by some their abundance is considered more a nuisance than an ornament.

PYRUS. All the species bear some fruit, more or less ornamental, but the abundant bright scarlet berries of the *P. aria* and *aucuparia* are specially noticeable as conspicuous and beautiful objects.

RHAMNUS CATHARTICUS. When profusely adorned with its dark blue berries, especially as a hedge-bush, it forms a very pretty object.

- ROSA RUBIGINOSA.** The Sweet-briar contributes to our enjoyments not only its fragrant leaves and pretty blossoms, but also its bright red coralline fruit, which continues to adorn the bush when its other more transient beauties have departed.
- SAMBUCUS RACEMOSA.** This is not the common Elderberry (which is hardly admissible amongst ornamental shrubs), but a species of more elegant habit, of which the berries are scarlet, of a large size, and borne in spreading umbels, which are very handsome.
- SKIMMIA JAPONICA and OBLATA.** The berries of the former are nearly round, those of the latter larger and of an oblate form. Both are very ornamental and freely produced.
- STAPHYLEA.** Both species bear a curious fruit. It is inflated and bladderly, whence the common name of Bladder Nut.
- SYMPHORICARPUS RACEMOSUS.** This is well known as the Snowberry and the large white berries which remain on the tree all the winter give it a very distinctive appearance.
- TAXUS BACCATA.** The very pretty berries of the Yew entitle it to a place in this division. They are somewhat of an acorn shape, the fleshy cup, of a beautiful coral hue, half inclosing the nut, which is of an oval form.
- VIBURNUM LENTAGO.** All the species of *Viburnum* bear fruit, more or less ornamental, but this is the one of which the berries are prettiest and most abundant. They are black, roundish, and very conspicuous after the fall of the leaves.
- VIBICUM ALBUM.** The white, semi-transparent berries of the Mistletoe are intimately associated in our minds with the scarlet berries of the holly, and the two with Christmas festivities and snow-storms. But, like many of our wild plants, it is nearly untameable, and to produce your own "mistletoe boughs" in your own garden is by no means an easy task.
- VITIS LABRUSCA.** The wild Vine produces fine bunches of dark purple berries; but, whilst ornamental enough, the flavour is so inferior to the produce of the *V. vinifera* that the tree can only be cultivated for decorative purposes.

CHAPTER SIXTH.

TREES CONSIDERED AND CLASSIFIED WITH REFERENCE TO THEIR TIMBER AND WOOD—TO THE COLOUR, ETC. OF THEIR BARK.

It is the distinctive prerogative of Trees and Shrubs over the other members of the vegetable family, that, in addition to the benefit derived from their foliage, flowers, and fruit, they furnish man with shelter and fuel. Wood, which is a component part, and sometimes the exclusive material, in every human habitation, is in that and other ways essential to his physical well-being. Nature has kindly distributed the boon with a pretty equal hand over all regions of the globe; and it is only from the polar zones, where even the *Betula nana* ceases to grow, that man also retires.

As it is from the point of view of decoration alone that this work professes to treat of trees, the first of the subjoined lists is limited to such hardy ornamental species as are noted for producing valuable wood, and is not intended as a complete enumeration of timber trees. It will, however, prove not far short of it, as nearly all those giants of the forest whose wood is serviceable to man, claim at the same time our admiration as elegant or noble objects. Thus in planting there is no essential incompatibility between the *utile* and the *dulce*; and whilst embellishing our landscapes by interspersing amongst the old species a large variety of more novel trees, we are not neglecting the useful whilst recommending the ornamental. For instance, to take the *Coniferæ* alone, the *Abies Douglasii* and *nobilis*, the *Cedrus Deodara*, the *Pinus excelsa* and *Laricio*, are not only very handsome, distinct, and hardy

species, and exceedingly desirable from an æsthetical standpoint, but, at the same time, most valuable, economically, as timber-producing trees.

In list No. 23 are classed those species in which the bark forms a prominent feature as being remarkable for its colour, texture, etc. This group is peculiarly interesting to those who may be laying out new, or remodelling old, ornamental plantations. The admixture amongst other trees of a few whose bark exhibits some distinctive character is very striking and effective. Who has not noticed the fine contrasts brought out in our woods by the glossy white bark of the common Silver Birch, or the warm red of the Scotch fir? Even in our London squares, the peeling cuticle and the irregular blotches on the bark of the plane-trees give a sense of variety and exhibit a pleasing uncouthness. The list in question, although but too short, still offers materials for the picturesque which ought not to be overlooked.

LIST 22.

Species remarkable for producing valuable Timber or curiously grained or coloured Wood:—

ABIES. Of this genus, prolific in trees of large dimensions, the following are the best timber-bearing species as far as is at present ascertained, though, when the more recently introduced species attain timber size, some of them may prove equally valuable:—

A. Douglasii, excelsa, nobilis, picea.

ACER PLATANOIDES and **PSEUDO-PLATANUS** produce firm, finely-grained and easily-worked wood, which is used for a variety of purposes. *A. rubrum* furnishes a solid and fine-grained wood, susceptible of a high polish, and was largely employed in America in the manufacture of furniture, until supplanted by mahogany. The wood of *A. saccharinum* is largely used by cabinetmakers, especially the old trees, in which the fibre is undulated with occasional spots. In this condition it is called "Bird's-eye Maple," and is highly esteemed.

BETULA LENTA. This is the most valuable for its wood of all the

- birches, being of a rosy colour, fine-grained, and possessed of considerable strength.
- BUXUS SEMPERVIRENS.** Boxwood is very heavy (it sinks in water), hard and close, takes a good polish, and is largely used for wood-engraving and turnery.
- CARAGANA ARBORESCENS.** The wood (which, however, never attains any great size) is remarkably tough and close, and of a yellow colour, striated inside with reddish streaks.
- CARYA.** The timber of all the species of Hickory possesses nearly the same properties—viz. great strength and toughness. In America it is almost exclusively used for cask-hoops, to which purpose it is peculiarly well adapted.
- CEDRUS.** Of the three known species of Cedar, the *C. Atlantica* is of too recent introduction to have been tested as a timber tree; the *C. Libani* proves (in this climate, at least) inferior to its old reputation, for its wood is soft and spongy, and devoid of either strength or durability; the *C. Deodara* produces by far the best timber, it being compact, close-grained, and susceptible of a fine polish. In addition to these qualities, it is of great endurance, and emits a grateful resinous odour.
- CELTIS AUSTRALIS.** The European Nettle-tree furnishes valuable timber. It is compact, dense, heavy, and tough. The wood of the other species is, on the contrary, weak, and of little value.
- CERASUS PADUS, VIRGINIANA, and VULGARIS.** The wood of these three species is in great demand for ornamental purposes, as it is close-grained, of a rich red hue, and finely veined.
- CHAMÆCYPARIS SPHÆROIDES.** It is a pity that the White Cedar is of such slow growth, as it is quite hardy, and produces excellent timber. It is light, fine-grained, and emits a fragrant odour.
- CRATÆGUS.** Few of the Thorn family attain even 25 to 30 feet in height, and, although long-lived, the trunks remain of very moderate diameter. On the other hand, the wood becomes much twisted, very dense, and, in proportion, hard and tough. That of the *C. punctata* becomes so indurated, that it is used for wedges to split other trees.
- CUPRESSUS SEMPERVIRENS.** The timber of the Cypress (which is abundantly produced in South Italy and the Levant) is of great strength and durability, and was much more extensively used formerly than it is now. In this country it is of too slow a growth to be of much value in this respect.
- DIBCA PALUSTRIS.** Although only a small shrub, it is noticeable under

this division for the uncommon toughness of its bark and wood, which has procured for it in Virginia the name of Leather-wood.

FAGUS SYLVATICA. Beautiful and majestic as is the Beech, its timber does not rank in excellence with some other forest trees of similar dimensions. It is brittle and of little durability, and not applicable to important purposes. It is, however, used for a vast number of minor objects, it being both abundant and cheap. The wood of the *F. ferruginea* is similar in quality, but it has the peculiarity of being reddish in colour.

FRAXINUS EXCELSIOR. In toughness and elasticity the timber of the Ash surpasses that of all other forest trees, even including the Oak. It is accordingly of high value, and is in great demand for a multitude of purposes.

ILEX AQUIFOLIUM. The wood of the Holly is very hard, and generally almost as white as ivory. Dyed black, it is a good substitute for ebony, and it is applicable to so many useful purposes, that, were it more plentiful, it would be largely employed by turners and cabinetmakers.

JUGLANS REGIA. The reputation for beautifully veined and coloured wood which the Walnut has deservedly acquired, has hardly suffered even now that the globe has been ransacked to procure the finest possible woods for our cabinetmakers; and it is still a favourite material for ornamental furniture, etc. Of the other species, the *J. nigra* furnishes wood of about the same quality, but that of the *J. cinerea* is inferior.

LARIX EUROPÆA. The wood of the Larch is found to be highly serviceable in multifarious ways, so that, from the active demand for it, it commands a full price. At the same time, it is of rapid growth, so that no tree more quickly repays the outlay of the planter, and none has for many years past been more extensively planted.

LIQUIDAMBAR STYRACIFLUA. This tree produces a very compact and fine-grained wood, susceptible of a brilliant polish. It is therefore well adapted to ornamental purposes, but it is liable to decay if exposed altogether to the open air.

LIRIODENDRON TULIPIFERA. The Tulip-tree furnishes very useful, if not first-class, timber, which is found very serviceable in those parts of North America where the tree is abundant, and amongst other purposes for furniture and inlaying.

MAGNOLIA ACUMINATA. This is the only one of the Magnolias of which

the wood is of any value, and even in this instance the only properties that recommend it are its orange colour and the delicacy of the grain.

PINUS. Almost every species of this extensive genus furnishes timber of more or less value, but the following are those in most general repute for the useful properties of their wood :—*P. Austriaca*. Very hardy and robust ; timber strong and resinous. *P. Cembra*. Slow of growth when young, but more rapid later on ; hardy and long lived ; wood soft and weak, but very fine-grained, easily worked, and much used for turnery and wood-carvings. *P. excelsa*. Of rapid growth and quite hardy ; timber white, resinous, rather soft, similar in its properties to that of the *P. strobus*, which the tree greatly resembles in most other respects. *P. Laricio*. Hardy and vigorous ; timber of full-grown trees very serviceable. In Corsica, to which island it is indigenous, it is used for general purposes, and found to answer very well. *P. mitis*. The Yellow Pine of the Americans, who use it largely, and export it to England in considerable quantities. *P. Pinaster*. The Cluster Pine does not produce very valuable timber, it being soft and unable to withstand exposure to atmospheric influences, but this tree has the advantage of growing rapidly, and of thriving in sandy districts and on the sea-shore, where other trees can barely live. *P. strobus*. The White Pine of the Americans, better known here as the Weymouth Pine. It is most extensively used in America, and imported by us in large quantities. The timber is soft and liable to decay if exposed to the weather, but under cover, for boards, doors, etc., it is very serviceable, being white, free from knots, and easily worked. *P. sylvestris*. No timber is applicable to so many useful purposes as the well-known Scotch Fir. It has most of the qualities required in timber, without possessing any in a pre-eminent degree, so that it is rather generally than specially valuable. It may be noted that trees raised in poor soils, and hence but slowly developed, furnish better timber than those planted in fertile and sheltered spots, which make a more luxuriant and rapid growth. This observation is indeed applicable to almost every timber tree, and suggests a variety of inferences in regard to the essential difference between planting for ornament and planting for timber. Of late years many new species of pines have been introduced, most of them attaining in their native habitats huge dimensions, and of these several will doubtless prove valuable timber trees in this country ; but until experience shall have

enabled us to judge how far their properties in that respect may endure or be modified under the new conditions of climate, soil, etc., it is difficult to assign to them their proper place in this section.

PLANERA RICHARDL. One of the most valuable of timber trees. The wood unites the sterling qualities of oak and ash, with the fine grain, compactness, agreeable colour, and curious veining of the more ornamental sorts. It is very hardy, of tolerably rapid growth, and both foliage and spray are very attractive.

POPULUS. Almost all the species of Poplar are amongst the fastest-growing trees known, and this very peculiarity detracts from the value of their timber by the elaboration of soft and sappy wood. The following are the species which yield the most serviceable and the least objectionable timber—viz. *P. alba*, *fastigiata*, *monilifera*, *nigra*, and *tremula*. Of these the latter two are probably the best.

QUERCUS. Of all the numerous species of Oak, none equal the two British ones in respect to the production of valuable timber; only a few even approach them, and by far the greater number produce wood of a very inferior quality. Amongst the latter is that group known as the American Red Oaks. Unsurpassed as they are in beauty of foliage, their wood is soft, spongy, weak, and quick to decay. The following are the species which produce the best timber:—*Q. alba*, the American White Oak, largely used in America. *Q. Cerris*, the Turkey Oak; the wood of which is extensively employed for general purposes in the Levant, and found strong and durable. *Q. Ilex*, the Evergreen Oak. It produces excellent timber, perhaps only second in quality to our British Oak. *Q. pedunculata*, the stalk-flowered variety of the English Oak. *Q. Phellos*, the Willow Oak, found very serviceable in America, the wood possessing great strength and tenacity. *Q. sessiliflora*, the sessile-flowered variety of the British Oak. *Q. virens*, the Live Oak. It produces by far the best timber of any of the American oaks. It is much esteemed for ship-building, as well as for all other purposes where great strength and durability are required.

RETINOSPORA OBTUSA. In Japan this tree attains a great magnitude, and its timber is said to be of first-rate quality. If it should prove hardy in this country (which seems more than probable), it may not be unreasonable to hope that we shall find it a valuable timber tree.

SALIX. Of the Willow, Loudon, in his *Arboretum Britannicum*, has listed upwards of 200 species! A few of these are ornamental, a few useful, but the vast majority are neither. Indeed, many are but accidental or local varieties, and not distinct species, and might with advantage have been altogether discarded from the list. The only species which have any claims to notice as timber-producing trees are the *S. alba*, *fragilis*, and *Russelliana*, the latter two being very nearly identical, and all three producing wood available for many useful purposes. Several species (the Osier, etc.) are largely cultivated for the purposes of basket-making, etc.

SEQUOIA SEMPERVIRENS. To all appearances this will grow with us into a large tree. In California it attains the altitude of 200 feet, and the timber is there held in great esteem for its many valuable properties.

TAXUS BACCATA. The wood of the Yew, slowly elaborated as it is, becomes when of any size of great value. It is of a fine colour, hard, close-grained, elastic, and almost indestructible. It is one of the most ornamental woods for cabinetmakers' purposes, and there is hardly any requisite in timber which it does not fully meet.

TILIA. The wood of all the three species of Lime described in this work possesses nearly the same properties. It is not strong, but close-grained, smooth, light, and is peculiarly well adapted for turning and carving. It is consequently in good demand for making a number of smaller utensils, toys, bowls, etc., and meets with a ready sale.

ULMUS. All the species of Elm enumerated in this work bear valuable timber, which is adapted to a variety of useful purposes. Of these, perhaps the *U. Americana* is the least hard and compact, but all of them meet with a ready sale at good prices.

VIRGILIA LUTEA. This is the Yellow Wood of the Americans, so named from the deep yellow colour of its wood, which, at the same time, is soft and fine-grained. The tree, however, grows very slowly, and rarely attains such a size as to make it valuable in an economical point of view.

WELLINGTONIA GIGANTEA. Our knowledge of this tree is confined to a few gigantic specimens of very ancient date, and to those planted in this country, the oldest of which was a mere seed twenty-five years ago, so that no definite verdict can be given as to the value of its timber, which, however, is suspected of being too light for most purposes of importance. But it may be stated with certainty

that the tree is hardy, that it averages an annual growth of more than one foot per annum, and that the bole of the tree is of very large diameter as compared with the height, so that, should this peculiarity be constant, the quantity of timber produced will be large in comparison with other trees in the same stage of growth.

LIST 23.

Species remarkable for the Colour, Texture, or other properties of their Bark:—

- ACER RUBRUM.** In trees not exceeding 25 to 30 feet in height, the bark is smooth and conspicuously marked with white blotches.
- ACER STRIATUM.** The bark, both on the trunk and the branches, is beautifully marked with longitudinal white and black stripes on a green ground. This interesting feature is very conspicuous in winter when the tree is denuded of leaves.
- ARBUTUS ANDRACHNE and PROCERA.** These two species are very remarkable for the peeling off annually of the outer bark, so that the wood remains denuded and presents a perfectly smooth surface of a reddish colour.
- BETULA ALBA.** Well named the Silver Birch, the cuticle of the bark being white, with a glossy surface, except in very old trees, in which the bark becomes cleft and corrugated.
- BETULA BHOJPUTRA and PAPYRACEA.** In these species the bark is also of a brilliant white, and the cuticle comes off in large thin laminae, which have many of the properties of paper, and in some regions are used as a substitute for it.
- BETULA NIGRA.** The bark of this tree is reddish, and peels off into thin transparent sheets, which is a peculiarity common to nearly all the birches.
- CARPINUS AMERICANA.** The smooth bark of this tree is spangled over with white spots, which give it a very distinctive and handsome appearance.
- GARYA ALBA.** The bark scales off in pieces from 1 to 2 feet long, which curl up at the ends and leave only the middle attached; a process which imparts to the tree at certain seasons a very peculiar and interesting aspect.
- CORYLUS COLURNA.** The bark of this gigantic hazel exhibits peculiarities similar to that of the birches. It is whitish in colour, and peels off in transverse stripes or shreds.

EUONYMUS ALATUS. The stems and twigs of this shrub are clothed with a lateral expansion of the bark into a corky substance, which gives them a curious winged appearance.

FRAXINUS EXCELSIOR, var. AUREA. This singular and ornamental variety has the bark of a golden yellow colour, with black spots, which come out very strikingly when the tree is denuded of foliage.

LAURUS BENZOIN and SASSAFRAS. The bark of both species is highly aromatic and fragrant, and that of the latter possesses medicinal properties which were formerly held in great esteem.

LIQUIDAMBAR STYRACIFLUA. A corky substance frequently appears in irregular longitudinal streaks on the bark of this tree, but it is not a constant character, as in many individuals there is little or no trace of it.

NEGUNDO FRAXINIFOLIUM. The bark of the shoots and smaller branches is of a lively green colour, and peculiarly smooth and glossy, giving them the appearance of some of the prettiest of our green rushes.

PLATANUS. The bark of both species peels off annually in large irregular patches, so that a peculiarly blotched appearance is given to the trunk of the tree, which contrasts strikingly with the bright green tint of the foliage.

QUERCUS ALBA. The bark of this tree, when well grown, is of a silvery white, with occasional black blotches, and this peculiarity makes it easy to distinguish it from all other species of Oaks.

QUERCUS SUBER. This is the well-known cork-bearing Oak, the detached outer bark of which is to be found in a larger or lesser quantity in every civilised dwelling throughout the world, from the palace to the cottage, performing functions for which no other substance has as yet been found so well adapted.

SALIX ACUTIFOLIA and PURPUREA. Those willows have long, slender, drooping shoots, which are very smooth, of a rich purple colour, rendered glaucous by a silvery powder, like the bloom on a plum.

SPARTIUM JUNCEUM. The branches are quite round and smooth, and are of a beautiful bright green colour, so that the more slender shoots bear a great resemblance to rushes,—whence its specific name.

ULMUS SUBEROSA. The bark of this species of Elm becomes, after one or two years, covered with a corky substance, which is very dense and compact, with deep fissures, and gives the tree a very distinctive appearance.

CHAPTER SEVENTH.

TREES AND SHRUBS CONSIDERED AND CLASSIFIED WITH REFERENCE TO THEIR UTILITY IN THE ARTS AND OTHERWISE.

THE interesting group, of which a list is subjoined, includes those species which subserve in a variety of ways to the necessities or comforts of man. They are almost all natives of foreign countries, which have been from time to time introduced, and are now acclimatised amongst us. But, although they thrive here sufficiently to make them acceptable to us as objects of beauty, yet hardly any of them grow so vigorously or so abundantly in England as to render their cultivation remunerative in our climate, and it is only in their native countries that their products are so copiously and cheaply evolved as to be profitably raised for purposes of commerce. It must, however, enhance the interest we take in the species constituting this group, to reflect that whilst they are sufficiently ornamental to obtain admittance into this work, they possess the additional advantage of being identified with valuable products which minister to our wants or our pleasures.

LIST 24.

Species remarkable for their Utility in the Arts or otherwise:—

ABIES EXCELSA. The resinous product of the Spruce Fir, known in commerce, after undergoing a clarifying process, as Burgundy pitch, oozes slowly from a lesion of the bark made by an instrument adapted to this purpose. This operation injures the tree, which only survives it a few years.

ABIES NIGRA. It is from this species that, in North America and Canada, spruce beer is made. The process is rather complicated

but the staple material is the sprigs of the *A. nigra*, which are submitted to the action of boiling water until the bark separates from the wood.

ACER SACCHARINUM. The Sugar Maple covers a large tract of country in N. America, between latitude 45° and 50° N., and within that zone is found most abundantly. For many generations it furnished an efficient substitute for the juice of the sugar-cane, but has now yielded to the superior abundance and cheapness of the latter. The mode of procuring and preparing the sap for the production of the sugar has been explained elsewhere.

AILANTUS GLANDULOSA. It is on the leaves of this elegant tree that the silk-producing *Bombyx Cynthia* feeds and produces its cocoons. The experiment of rearing this species of silk-worm in England has failed (as explained at pp. 26-28); but in Japan the production is very large, and the material, although wanting the fineness and gloss of the mulberry-silk, is produced at far less cost and is more durable.

ASTRAGALUS TRAGACANTHA. It is supposed that this is the plant from which the gum known by the name of Tragacanth is extracted; but there is no authentic account of the mode of extraction, nor is there even any actual certainty that this is really the plant from which it exudes.

BROUSSONETIA PAPIRIFERA. In Japan the bark is separated from the wood by boiling, and submitted to various processes, by which it is made into paper of various qualities, the finer of these being of very close texture. In Otaheite dresses are made of it.

CISTUS LADANIFERUS. This is the true Gum Cistus from which the Gum Ladanum is chiefly procured, and for which the *C. Cyprius* is commonly mistaken; but the gum is obtainable from both, as also from *C. Ledon* and other species, though probably in lesser quantities.

ILEX AQUIFOLIUM. Bird-lime is prepared from the bark of the holly. It is manufactured on a large scale in Italy and in the Levant, from which places our supply is chiefly drawn.

JUNIPERUS COMMUNIS. It is from the berries of the Juniper that the spirit known as gin derives its peculiar flavour and properties. Unfortunately the spirit in which the berries are infused is frequently coarse and adulterated, and its impurity is by no means imputable to the Juniper, but only to the vehicle which contains its infusion.

- JUNIPERUS SABINA.** The leaves are used in medicine as a powerful diuretic and emmenagogue.
- JUNIPERUS VIRGINIANA.** The wood of this species and of the *J. Bermudiana* is used, under the name of Red Cedar, in the manufacture of lead-pencils. It has a pleasant odour, and but for its scarcity and consequent dearness would be largely employed for various other purposes.
- LAURUS SASSAFRAS.** The bark is used medicinally as a sudorific, and from the wood (in chips) a decoction is made which is still prescribed for various complaints, although the fashion which prevails in favour of stronger and more condensed medicines in smaller quantities has diverted attention from the properties of the *Sassafras*.
- LAVANDULA SPICA.** The essential oil which resides in the flowers and flower-stalks of the Lavender, and, in a lesser degree, in the leaves, is extracted by distillation, and, mixed with spirits of wine, forms the well-known lavender-water. It is also used medicinally in the form of tincture, etc.
- LIQUIDAMBAR STYRACIFLUA.** A resinous gum is extracted from this tree, exuding from fissures in the bark. It is known as the White Balsam of Peru, is highly aromatic and stimulant, and is used in a variety of ways; amongst others, in France, as a perfume.
- MORUS ALBA.** The best leaves on which to feed the silkworm are those of the White Mulberry, those of most other species being far less esteemed for that purpose; but the fruit is very poor and barely eatable. On the other hand, whilst the *Morus nigra* (or Black Mulberry) produces the exquisite fruit which is so popular, its leaves are of little account as silkworm food, and are never used when those of the *Morus alba* can be obtained.
- MYRICA CERIFERA.** Wax is obtained from the berries of this plant in sufficient quantity to make it commercially valuable. It is derived from an unctuous white matter that lines the surface of the berries.
- PINUS.** From nearly all the species of pine various resinous products are obtained in more or less abundance, which are used in various forms, such as tar, turpentine, rosin, etc. etc. In particular, the *P. pinaster* in France, and the *P. rigida* in America, are largely used for that purpose, both species being noted for the large quantity of resinous matter which they afford.
- QUERCUS ÆGILOPS.** The large woody cups containing the acorns of this species of oak are imported from Asia Minor in enormous

quantities, under the name of Valonea, for the use of the tanners. Some idea may be formed of the vast extent and productiveness of the forests of this oak in Anatolia, when it is stated that to this country alone they furnished last year 30,000 tons of these acorn-cups (without the acorns). They contain more tannin in a given bulk than any other vegetable substance.

QUERCUS COCCIFERA. This species (and no other known plant) feeds and harbours a peculiar insect called kermes (*Coccus Ilicis*, Linn.), which is attached in clusters to its branches, and finally assumes the form of a small seed or berry. It produces a deep red dye of great permanence, and was largely used for that purpose before the introduction of the cochineal insect (*Coccus Cacti*) from Mexico, which, from its great abundance, and from its producing ten times as much colouring matter from the same weight of substance, has now quite supplanted it.

QUERCUS PEDUNCULATA and **SESSILIFLORA.** These two species of the British oak, formerly coupled under the name of *Q. robur*, annually furnish to the tanners an immense supply of bark, used by them in the manufacture of leather. The greatest percentage of tannin is extracted from bark of from 20 to 30 years' growth.

QUERCUS SUBER. The Cork-tree carries in its name an explanation of its value as a contributor to the general fund of usefulness which man derives from the vegetable world. Our annual importations of cork amount to about £200,000 in value, of which sum Spain and Portugal are the principal recipients.

SALIX VIMINALIS. This is of all the species of willow the best adapted for basket-making, for which purpose it is extensively grown and largely used. It is a mistake to suppose that an osier plantation will flourish in wet, undrained soil; on the contrary, the land must be thoroughly drained and well manured; but it should be so placed as to be occasionally soaked with water during the summer months.

SMILAX SARSAPARILLA. Formerly this was a favourite remedy for scrofulous and cutaneous complaints, but it has now fallen into comparative disuse, destined perhaps to become again fashionable in cyclical rotation.

SPARTIUM JUNCEUM. The shoots of this plant furnish a very good fibrous material when treated in somewhat the same way as flax. In the south of Europe, where it abounds, it is found to be a very good substitute for hemp and flax.

STYRAX OFFICINALE. The true storax is produced from this shrub

by incisions in its bark. It is a balsamic substance of great fragrance, and is a powerful stimulant and expectorant. It also enters largely into the composition of the incense used in Catholic churches.

THEA VIRIDIS. This and the *Thea Bohea* (which, however, is less hardy and vigorous) furnish the leaves, a decoction of which, under the name of tea, furnishes the most universally-adopted beverage known, and the use of which is still extending. It may be worthy of remark, that its chief, indeed almost exclusive, consumption is amongst the Mongolian (Chinese) and Anglo-Saxon races, and that, at the same time, of all other races, they are the most industrious, energetic, numerous, and prolific. The wine-drinkers are comparatively stationary in numbers and power; the tea-drinkers are rapidly progressing in both respects. If the facts are not actually connected as cause and effect, they are curiously coincidental.

CHAPTER EIGHTH.

SPECIES WITH FASTIGIATE, HORIZONTAL, OR PENDULOUS BRANCHES—REMARKABLE FOR SINGULARITY OF ASPECT—FOR RAPIDITY OF GROWTH—SUITABLE FOR HEDGES—THRIVING UNDER THE DRIP OF TREES—IN THE SMOKE OF CITIES—ON THE SEA-COAST—IN PEAT SOIL—IN SWAMPY PLACES—LIST OF PLANTS REQUIRING PROTECTION.

THE diversity of nature is so literally infinite, that not only do the genera and species of plants exhibit distinctive peculiarities, but amongst individuals of the same species, and even amongst those raised from the seed of the same individual tree, no two have ever been found precisely alike; just as, few as are the features of the human face, or few as are the lines and curves of which handwriting consists, no two faces, and no two handwritings have ever been found to be exactly identical. Still there are general forms of outward resemblance, or similarity of growth, by which we are enabled to constitute groups, composed of plants possessing perhaps no botanical affinity, but having certain points of approximation in shape, in adaptation to the purposes of man, in the speciality of soil or climate which they affect, or in respect to other incidental relations. For instance, we may take the following divisions, viz.—

LIST 25.

BRANCHES FASTIGIATE.—Several trees have their branches growing upright and close to the stems, giving them the appearance of a column or narrow-based pyramid. Of these

the most marked are *Acer Lobelii*; *Cratægus tanacetifolia*; *Cupressus sempervirens*; *Juniperus excelsa*, *Hibernica*; *Podocarpus Koraiana*; *Populus balsamifera*, *fastigiata*; *Quercus fastigiata*; *Robinia pseudacacia stricta*; *Taxus baccata fastigiata*; *Thuja Lobbii*, *occidentalis*.

LIST 26.

BRANCHES HORIZONTAL OR PENDULOUS.—Many other pendulous varieties besides those here named are obtained artificially by grafting. But, confining ourselves to botanical species, with the exception of a few of the commoner artificial varieties, the following are the most interesting examples of a form of growth, which, if not introduced too profusely, imparts elegance and grace to plantations, becoming, however, insipid when in excess:—*Andromeda floribunda* (globular, feathering to the ground); *Abies Canadensis*; *Betula alba pendula*; *Biota pendula*; *Cedrus Deodara*, *Libani* (in horizontal stages); *Cephalotaxus Fortuni* (horizontal); *Cratægus crus-galli salicifolia* (with a flat head like a table); *Cryptomeria Japonica* (branches horizontal, ends drooping); *Cupressus funebris* (too lately introduced for its beauty as a weeping tree to be as yet developed); *Dacrydium Franklani* (a great acquisition if it should prove quite hardy); *Fagus sylvatica pendula* (one of the most graceful of the weeping tribe); *Fraxinus excelsior pendula*; *Juniperus recurva*, *oblonga pendula*; *Larix Americana pendula*; *Salix Babylonica* (the well-known and ever-welcome Weeping Willow); *Sciadopitys verticillata* (the Japanese Parasol-tree, much extolled, but too recently introduced for judgment as to its probable behaviour in this country); *Taxodium Sinense*; *Taxus baccata Dovastoni*, *adpressa* (both branching horizontally); *Tilia alba pendula*; *Ulmus montana pendula*.

LIST 27.

SPECIES REMARKABLE FOR SPINES AND GENERAL SINGULARITY OF ASPECT.—*Abies orientalis* (leaves so closely adpressed as to give the young shoots the appearance of green ropes); *Araucaria imbricata* (densely clothed with stiff prickly leaves, which remain on the branches and trunk for many years, and render it so inaccessible as to justify its popular name of monkey-puzzle); *Astragalus tragacantha* (with peculiar spiny petioles); *Atraphaxis spinosa*; *Caragana jubata*, *spinosa* (the prickly branches of which are used by the Chinese to protect the tops of walls as we use broken bottles); *Cerasus depressa* (branches growing close to the ground, and covering a large space); *Colletia cruciata* (of very eccentric aspect, with abundance of pretty bell-shaped flowers, but rather impatient of severe frosts), *horrida* (more hardy, and bearing flowers nearly as pretty and abundant); *Cotoneaster microphylla*, *thymifolia* (closely trailing to the ground); *Cratægus crus-galli*, *macracantha*; *Genista sagittalis* (winged stems), *triquetra* (very prickly, abundant blossoms); *Gleditschia triacanthos*, *ferox*; *Maclura aurantiaca* (long spines, curious fruit); *Paliurus aculeatus*; *Robinia pseudacacia tortuosa* (waved branches, dense foliage); *Rosa ferox* (closely-tufted spines); *Salix helix* (branches occasionally furnished with dense twiggy tufts).

LIST 28.

SPECIES REMARKABLE FOR RAPIDITY OF GROWTH.—Soil, altitude, and climatic influences, are the most powerful agents in respect to the growth of plants. The same tree, which in a deep alluvial soil, in a sheltered valley, and in a situation neither too dry nor too damp, will attain a gigantic bulk and height, will be starved in a shallow gravelly soil, or stunted on a bare exposed hill, or become speedily decayed in an undrained wet

hollow. But, given equal telluric and atmospheric conditions, we find that different trees have very different rates of increase. As a rule, those plants which are of shortest duration grow quickest when young, but this rule, like most others, is liable to many exceptions. In the first place, it does not apply to climbing and twining plants, which sometimes grow slowly when young, and rapidly when they have obtained a good footing. The Ivy is an example of this, whilst the American Creeper is an instance in the opposite direction. Again, many long-lived trees grow with remarkable rapidity, and attain great altitude in a much shorter space of time than others. But, on the whole, the annual rate of growth in large trees diminishes as they get older, till at last the increase in height becomes so imperceptible that the maximum of growth seems to be reached long before the tree exhibits symptoms of decay. Many an oak barely 80 feet high is known from reliable data to be 600 years old. This gives an average annual growth of only one inch and a half, whereas a vigorous sapling will for several years make shoots of from 12 to 18 inches in a season. The *Wellingtonia gigantea* when young sometimes shoots up 2 to 3 feet between spring and spring, and even our tallest specimens average 12 inches within the same period. If this rate of growth were not greatly reduced as the trees grew taller, we should fix from 300 to 400 years as the age of the largest of the giant trees in California—a computation generally deemed very far below the mark. In the following list of rapidly-growing species, climbing shrubs are omitted:—*Abies Douglasii*, *grandis*; *Acer eriocarpum*, *macrophyllum*, *platanoides*, *pseudo-platanus*; *Ailantus glandulosa*; *Betula alba*; *Castanea vesca*; *Cupressus Lawsoniana*, *macrocarpa*; *Negundo fraxinifolium*; *Paulownia imperialis*; *Pinus insignis*, *pinaster*; *Platanus occidentalis*; *Populus alba*, *fastigiata*, *monilifera*; *Robinia pseudacacia*; *Salix alba*, *Babylonica*; *Thuja Lobbii*; *Ulmus glabra vegeta*; *Wellingtonia gigantea*.

LIST 29.

SPECIES SUITABLE FOR FORMING HEDGES.—Plants to be adapted to this purpose—*1st*, Should bear clipping well, or, as our forefathers would have expressed it, should, in order to fit them for the topiary's art, not be impatient of the shears; and, *2d*, Should have dense branchlets and foliage. Those two are indispensable conditions, whilst the following are secondary, but very desirable qualities:—*1st*, That the leaves should be evergreen; *2d*, That the plants should be of slow growth; *3d*, That they or their leaves should be clothed with prickles; *4th*, That the trunks and roots should not readily grow to a great size. Some of the subjoined plants combine these requisites in a greater degree than others, but under varying circumstances all may have claims to selection.

Abies excelsa (forms a dense hedge very rapidly, but soon becomes denuded at the base); *Biota orientalis* (quickly forms a good screen, but should not be planted on a raised bank); *Buxus sempervirens* (the dwarf variety usually serves, and is admirably adapted for edgings to flower-beds); *Carpinus betulus*; *Cerasus lauro-cerasus* (the common Laurel, too rank-growing for trim hedges, but forming a tall fence in a shorter space of time than any other plant); *Cratægus oxyacantha* (the Thorn, of which nine-tenths of the hedges in England are composed); *Cydonia Japonica* (of which the beautiful early flowers form the chief recommendation); *Cytisus albus* (probably never tried, but deserving of a trial); *Fagus sylvatica*; *Genista triquetra*; *Ilex aquifolium* (the Holly, if you give it decent soil to root in, if you are patient of its slow growth the first two years, if you keep it free from rank weeds, and if you clip it at the proper times, makes by far the finest, thickest, safest, and most permanently beautiful hedge of any. In olden times it was much valued for this purpose. Evelyn

describes in glowing terms the beauty of the long, wide, impenetrable holly wall by which his grounds were adorned as well as protected); *Ligustrum vulgare* (Privet, quick-growing, and nearly evergreen); *Philadelphus coronarius*; *Phillyrea media* (very close and compact, and evergreen, but slow of growth and requiring attention); *Rhamnus catharticus*; *Spiræa ariæfolia*; *Taxus baccata* (the Yew, evergreen, with dense foliage, but of slow growth, unless under favourable conditions as to soil, etc.); *Thuja occidentalis, plicata* (both excellent as screens to plantations, etc., but which will not grow well on raised mounds or banks, and therefore would not form hedges to keep out cattle, etc.)

Where a cheap hedge is wanted, why not try the common Gooseberry? Cuttings (to be had for nothing) strike freely in garden-soil, whence, if transplanted the ensuing year to the hedge-bank (provided it be sufficiently wide and flat to catch and retain the moisture from rain) they will rapidly grow into dense, prickly bushes, easily kept in shape by clipping, and never expanding either trunk or roots into such dimensions as to injure the bank on which they are planted.

LIST 30.

SPECIES THRIVING IN SHADE OR UNDER THE DRIP OF TREES.

—The power of thriving under the shade and drip of trees is a valuable, because a rare, property in shrubs, and renders a list of those possessing it very useful in cases where old plantations become denuded of branches near the ground, and present uncovered, and therefore unsightly, spaces of soil beneath. It must, however, be observed that some trees are far more unfavourable to the growth of shrubs beneath their shade and drip than others. Under the Yew, for instance, hardly any plant will grow, and the Coniferæ generally are adverse to vegetable life within the space covered by their branches. Amongst deciduous trees also there are great differences in

this respect; the Ash, for instance, is known to be very injurious to vegetation under its drip. The following, however, are found to be tolerably patient of a position under the shade of other trees, and are capable of thriving to some extent under circumstances which are highly deleterious to most plants:—*Androsæmum officinale*; *Aucuba Japonica*; *Berberis Japonica*; *Buxus sempervirens*; *Calluna vulgaris*; *Clematis flammula*; *Cornus alba*; *Corylus Avellana*; *Cotoneaster microphylla*; *Daphne Cneorum*, *laureola*, *Mezereum*; *Euonymus latifolia*; *Ephedra distachya*; *Gaultheria Shallon*; *Hedera helix*; *Hypericum calycinum*, *hircinum*; *Ilex aquifolium*; *Ligustrum vulgare*; *Lonicera periclymenum*; *Mahonia aquifolium*; *Mespilus Germanica*; *Rosa rubiginosa*; *Rubus laciniatus*, *Nutkanus*, *spectabilis*; *Ruscus racemosus*; *Sambucus racemosa*; *Skimmia Japonica*; *Spiræa salicifolia*; *Symphoricarpos racemosus*; *Taxus baccata*; *Vaccinium Vitis Idæa*; *Viburnum tinus*; *Vinca major*.

LIST 31.

SPECIES THRIVING IN THE SMOKE OF CITIES.—Of course, the expression “thriving” is to be understood as merely comparative. No plant can either grow or flower so well in the impure atmosphere of large towns as in the open country. But whereas most trees and shrubs dwindle away and die under the mephitic influence of air surcharged with carbon, etc., there are a few that will withstand it tolerably well. The list is not a long one, but it may be hoped that further experiments will be made with a view to extend it:—*Æsculus hippocastanum*; *Ailantus glandulosa* (a large tree with beautiful leaves, much used for shade in continental towns, and amongst other places on the Boulevards in Paris); *Ampelopsis hederacea* (the Virginian Creeper); *Amygdalus communis*; *Artemisia abrotanum*; *Aucuba Japonica*; *Catalpa syringæfolia*; *Cydonia Japonica*; *Cytisus Laburnum*; *Ficus carica* (the Fig-tree, occasionally

found in odd out-of-the-way nooks, courtyards, and close areas, not fruiting, but freely producing its beautiful large leaves); *Hedera helix*; *Jasminum officinale* (the Cape Jasmine, whose introduction dates earlier than our earliest gardening records); *Ligustrum vulgare* (and probably the *lucidum*); *Paulownia imperialis*; *Phillyrea media*; *Platanus occidentalis* (the Plane, which of all large trees is probably the one which answers best for city cultivation, owing to its smooth leaves and ever-peeling bark); *Quercus Ilex*; *Rhamnus Alaternus*; *Rhus typhina*; *Ribes sanguinea*; *Robinia pseudacacia*; *Sophora Japonica*; *Viburnum opulus*.

LIST 32.

SPECIES THRIVING ON THE SEA-COAST.—The powerful sea-breezes, and the salt spray which they convey to some distance inland, are both highly detrimental to most plants, and hence it is only in sheltered valleys abutting on snug bays that general plantations can be made to thrive near the sea. The following species, however, are found to flourish better than others under exposure to the sea-breezes:—*Acer Creticum*, *Monspessulanum*, *platanoides*; *Arbutus unedo* (and probably other species); *Colutea arborescens*; *Elæagnus hortensis*, *argentea*; *Fagus sylvatica*; *Ficus carica*; *Hippophaë rhamnoides*; *Hydrangea hortensia*; *Ilex aquifolium*; *Laurus nobilis*; *Lycium Europæum*; *Myricaria Germanica*; *Myrtus communis*; *Pinus pinaster*; *Quercus Ilex*, *suber*; *Rhamnus Alaternus*; *Tamarix Gallica*; *Taxus baccata*.

It is very desirable that a systematic course of experiments should be instituted, in order to discover other species that would stand sea-exposure. The beauty and healthiness of marine residences would be wonderfully enhanced by the adornment of trees and shrubs. The few that are now cultivated in such positions are so cut up, distorted, and stunted,

that they are rather eyesores than decorations. It is not the mechanical violence of the winds alone which causes the mischief, for many trees withstand fiercer gales in their mountain abodes; it is the saline particles with which the sea-breezes are impregnated which impair and finally destroy the vitality of the plants. Judging by the analogy of salt-loving plants indigenous to the steppes of Siberia, most of which are distinguished by glaucous or silvery foliage, it might not be amiss to experimentalise with species possessing the peculiarity of hoary or downy leaves, a list of which has been given at page 249.

LIST 33.

SPECIES REQUIRING, OR THRIVING BEST IN, PEAT-SOIL.—A considerable proportion of such plants belong to the family of Ericaceæ, and are commonly grouped together under the head of American plants, a denomination which convenience may justify, but which science cannot confirm, as many peat-loving genera are not American, and a vast proportion of the genera introduced from America do not particularly affect peat-soils. In the following list the genera only are given, as it seldom occurs that any species of a genus differs from the rest in regard to the nature of the soil in which they best flourish:—*Ammysine*; *Andromeda*; *Arbutus*; *Arctostaphylos*; *Asimina*; *Atraphaxis*; *Azalea*; *Calluna*; *Camellia*; *Cassiope*; *Clethra*; *Comptonia*; *Corema*; *Dabæcia*; *Daphne* (except *D. Mezereum*); *Dirca*; *Empetrum*; *Epigæa*; *Erica*; *Gaultheria*; *Gordonia*; *Illicium*; *Itea*; *Kalmia*; *Ledum*; *Lyonia*; *Magnolia*; *Malachodendron*; *Menziesia*; *Myrica*; *Pernettya*; *Phyllodoce*; *Polygala*; *Rhododendron*; *Stuartia*; *Thea*; *Tragopyrum*; *Vaccinium*; *Zenobia*.

LIST 34.

SPECIES THRIVING IN MARSHES AND SWAMPY PLACES.—Although the plants named below flourish best in wet

swampy soils, yet most of them do not refuse to grow in tolerably dry and elevated situations. In almost every case, however, peat-soil or an admixture of it round the roots will much assist the growth of the plant. *Alnus glutinosa*; *Arbutus unedo*; *Atriplex halimus*; *Betula nana*; *Cassandra calyculata*; *Chamæcyparis spherioidea*; *Dirca palustris*; *Gordonia pubescens*; *Ledum palustre*; *Myrica cerifera*, Gale; *Oxycoccus macrocarpus*; *Pinus strobus*; *Platanus occidentalis*; *Populus balsamifera*; *Salix* (most of the species); *Taxodium distichum*.

LIST 35.

SPECIES SUITABLE TO THE FORMATION OF COVERS FOR GAME.—There are but a limited number of plants which fulfil the conditions requisite for this purpose. Furze-bushes, brambles, brake, and heather, perform the office spontaneously, but only in an imperfect manner. A plant intended for a game-cover should afford both food and shelter. In fact, it ought to supply as many as possible of the following requirements:—*1st*, It should be able to withstand the drip of tall trees. *2d*, It should be sufficiently vigorous to cope successfully with the wild undergrowth around it. *3d*, It should be of rapid growth, so as quickly to cover a large surface. *4th*, It should bear edible berries, in order to contribute to the food of the game during winter. *5th*, It should, in preference, be evergreen, to afford the greater shelter during extreme cold. *6th*, The bark and young shoots should not be palatable to rabbits, etc., or it will meet with speedy destruction.

Few, indeed, are the plants which combine all these desiderata, but, of the following, each possesses some at least of the described requisites:—

ARCTOSTAPHYLOS UVA-URSI (Bearberry). Evergreen, spreading over a large surface; produces berries.

- BERBERIS DARWINII.** Evergreen, of vigorous growth ; produces berries.
- BERBERIS STENOPHYLLA.** Evergreen ; a rapid grower ; produces abundant crops of berries.
- CERASUS LUSITANICA** (Portugal Laurel). Evergreen ; of bushy growth, and bears berries.
- CORNUS ALBA** (American Dogwood). Bears the drip of trees, is of hardy growth, and produces berries.
- COTONEASTER MICROPHYLLA.** Evergreen ; pushes its trailing stems along the surface ; bears berries plentifully.
- CRATÆGUS PYRACANTHA.** Evergreen, of vigorous growth ; bears a profusion of wholesome berries.
- DAPHNE LAUREOLA** (Spurge Laurel). Evergreen ; uninjured by the drip of trees ; produces berries, which, though unfit for human food, are eaten by birds.
- GAULTHERIA SHALLON.** Evergreen ; extends by creeping roots, thrives under the drip of trees, and its berries a favourite food for game.
- GENISTA TRIQUETRA.** Grows rapidly, of very close compact habit, as prickly as the common furze, but always remains dwarf.
- HYPERICUM CALYGINUM** (Irish St. John's Wort). Evergreen ; rapidly increasing by its creeping stems ; of vigorous growth when once fairly established.
- HYPERICUM HIRCINUM.** Very hardy and quick of growth ; pushes up suckers abundantly.
- ILEX AQUIFOLIUM** (Common Holly). Evergreen ; stands the drip of trees, of compact habit, and affords excellent shelter.
- LIGUSTRUM VULGARE** (Privet). Nearly evergreen ; very hardy, and bears berries plentifully.
- MAHONIA AQUIFOLIUM** (Ash Berberry). Dense evergreen foliage ; berries abundant and wholesome.
- PERNETTYA MUCRONATA.** Evergreen ; foliage dense, and a fertile bearer of large berries.
- RHODODENDRON PONTICUM.** Evergreen ; of luxuriant growth, even under the drip of trees ; and, besides its well-known usefulness as a cover, exceedingly ornamental when in blossom.
- RUBUS NUTKANUS.** Very hardy, and extending itself rapidly by means of its creeping roots.
- SYMPHORICARPOS RACEMOSUS** (Snowberry). Very hardy, pushes up numerous suckers, and bears an abundance of white berries.
- TAXUS ADPRESSA** (Flat-leaved Yew). Evergreen ; thickly clothed

with foliage, spreading horizontally, and bearing fine scarlet berries.

SPECIES REQUIRING PROTECTION FROM SEVERE FROST OR WIND.—The present division comprises those plants which are not sufficiently hardy to stand our English winters (unless exceptionally mild), without some shelter or protection. Amongst them will be found some which are distinguished by beauty of flower or foliage; others remarkable for singularity, distinctness, etc.; and a third class interesting for their associations (as *Thea viridis*), or as types of decidedly tender genera (as *Dacrydium Franklinii*), etc. To an enthusiastic lover of trees, there is great pleasure in successfully rearing in the open air plants which are partially tender, and of which the native habitats are the sunny regions of the south, or, as in some cases, of the inter-tropical zones in very elevated positions. Their existence with us, if they only thrive even moderately, seems to extend our grasp of the vegetable world, and to bring us into nearer association with those remote scenes of which they constitute characteristic features.

Notwithstanding the efforts that have been made of late years to enlarge our stock of hardy and half-hardy exotics, numerous additions may yet be anticipated, not only from unexplored fields for botanical research, but out of our present large collection of greenhouse plants, of which many might prove hardy, or nearly so, if carefully experimented on. Who has not heard of the Aucuba's imprisonment under glass for many years, till it was at last found to be hardier than the common Laurel? It is natural, when a plant is newly introduced, and is both rare and costly, that the protection of a pit or greenhouse should be given to it. Many hardy plants have been thus petted on their entrance into English life, until experiment has proved the needlessness of such precautions by attesting their hardiness. But experiments have hardly been carried far enough in this direction. Is it likely that out of

the copious flora of Australia barely a dozen species should prove hardy? If these few, why not more? For instance, *Lomatia longifolia* has for many years lived, flowered, and several times fruited abundantly in the writer's garden, near London, without the slightest protection. It is a member of the large family of Proteaceæ, which numbers nearly 700 species, most of which are natives of New Holland. What should make *Lomatia longifolia* the solitary instance of a Protead proving hardy in our climate? Again, the order Myrtaceæ comprises 1300 species, of which some are indigenous to hot climates, but a very large proportion are natives of New Holland, probably half. Assuming the Australian species to number 600, how does it happen that one, the *Leptospermum lanigerum*, should be quite hardy, and the remaining 599 not even half-hardy? The inference may fairly be drawn that Australian plants have been assumed as requiring the greenhouse too much as a matter of course, and if so, we may hope some day to see the open garden recruited from a large storehouse of beautiful and interesting shrubs.

By the words "sheltered situation," in reference to the protection required by half-hardy or tender plants, it is not a close valley, or a ravine, or a low, damp, airless spot, or a confined enclosure, or a space surrounded and choked up by tall trees, that is meant. On the contrary, experience teaches us, that in such sites the natives of the more southerly climates will seldom survive our frosts. Their growth therein is too early, too rapid, and too prolonged, as compared with the severity of cold they have to endure from our winters. The shoots are too luxuriant and become etiolated, the wood cannot ripen in time to resist our autumn frosts, and its early growth is too tender to resist the nipping winds of our uncertain springs.

In dry uplands, open to the fresh breezes, where water does not accumulate but flows down into the valleys, and

where what moisture may remain is quickly evaporated, the growth of tender plants, although sufficiently vigorous and healthy, is retarded in spring, and checked in autumn, so that our frosts have comparatively little hold on them. Moreover, in low situations, especially if in the vicinity of hills or undulations, the cold, even though not so thermometrically intense, exercises a far more deleterious influence over vegetation than in elevated spots. Many persons may have noticed how frequently in spring the young fronds of the *Pteris aquilina* (common Braken) are blackened and withered by frost at the foot of a hill, whilst higher up they are untouched.

The modes adopted for protecting tender plants are numerous and diversified; for instance—training against walls, a bank with a southern exposure, a corner (of the same aspect) formed by walls or fences, a thick hedge constituting a screen from cold or violent winds, matting placed in winter either entirely or partially round the plant, encircling the stems with hay-bands, covering the roots and lower part of stems with litter, such as fern-leaves, or straw, or ashes, or stable manure, etc. etc. From these various processes a selection must be made, suitable to the requirements, size, or habit of the plant, and to the locality in which it is placed.

LIST 36.

Species requiring protection in this Country—

ACACIA DEALBATA, JULIBRISSIN, and LOPHANTHA. If these could be reared in the open air in England, their foliage, at once delicate and magnificent, more ornamental even than their beautiful blossoms, would give them admission into every garden. As it is, a south wall, and mats in the depth of winter, will preserve their vitality most years, and, at the worst, they will with that protection send up shoots from the roots of such luxuriant growth as rapidly to replace the lost stems.

ACER OBLONGUM and VILLOSUM. These two species are from the lofty hills of North India, and are very nearly hardy; but their large

and somewhat delicately-organised foliage is liable to injury from high winds, and they therefore require a sheltered situation.

A. Polymorphum also demands and deserves attention during frosts.

ALOYSIA CITRIODORA. The deliciously-scented leaves of this favourite shrub fully entitle it to a warm corner, and to some slight covering during severe frosts. It will, under these conditions, make vigorous leaf-laden shoots in summer. In fact, in the Channel Islands and the south of Ireland, it may be considered as quite hardy.

ARALIA SIEBOLDTII. Until it is quite certain that it will bear our climate, it will be well to mat it up in winter.

ARISTOTELIA MACQUI. This plant is a native of the mountainous districts of Chili, and requires some shelter from cold winds.

BENTHAMIA FRAGIFERA. It is generally cultivated in the conservatory, but it will bear our winters and thrive pretty well if placed in a sheltered spot and matted during very severe frosts.

BERBERIDOPSIS CORALLINA. A new acquisition from Chili, which appears likely to prove as hardy as the Indian and Patagonian species of its near relative *Berberis*. To obviate all risks, a little matting should be placed round it in severe weather.

BUDDLEA GLOBOSA. In wet and late autumns the new wood does not ripen, but remains soft and sappy, and, if early frosts set in, it is killed; but the main stem resists the cold, and sends forth new and vigorous shoots the ensuing season.

BUPLEURUM FRUTICOSUM. Shelter from cold easterly winds is necessary to preserve the young shoots, and sometimes even the entire shrub, from injury.

CAMELLIA JAPONICA. Very nearly hardy, as may be gathered from the remarks made in the article devoted to this plant in Part the first.

CASSIOPE TETRAGONA. It is not the temperature of our climate which is too cold for this little gem of the heath tribe, since it is a native of Lapland, but it is frequently killed by our winters from the want of that complete covering of snow which it receives in its native habitat, and for which a little litter might here prove a sufficient substitute.

CEANOTHUS AZUREUS. A native of Mexico, which, if trained to a wall, will flower and thrive well in our climate, different as it is from that of Mexico, with its cloudless sky, scorching heat in summer, and rarefied air from great altitude. Indeed its climate only approaches ours in regard to its rather cold winters.

CERASUS CAROLINIANA. This beautiful evergreen will not bear

without injury cold and cutting winds, especially in early spring when it is expanding its delicate glossy foliage ; but if sheltered by other trees, or in proximity to a wall or hedge, such protection will be sufficient to screen it from harm.

- CHAMÆROPS EXCELSA.** This curious type of tropical vegetation—this stray member of a family rejoicing in equatorial temperature and the burning sands of Africa, “*leonum arida nutrix*”—will, with moderate protection and in a warm nook, live in our gardens, and, though of slow growth, will annually develop a few of its characteristic leaves.
- CINERARIA MARITIMA.** A little litter thrown over it in winter will keep its main stems uninjured, and it will throw up strong shoots in spring.
- CISTUS PURPUREUS.** Liable to occasional injury in very severe winters, which a slight covering of litter would obviate. The two other species of *Cistus* described are quite hardy. A number of others (though very pretty) are omitted, as being too troublesome to preserve during winter.
- CUPRESSUS FUNEBRIS.** It is questionable if this tree (of whose beauty in China we read such glowing descriptions) be hardy, for, although introduced twenty years since, it is but little known, and fine specimens of it are very rare. It is necessary to shelter it during winter from the north-east winds by a matting.
- DACRYDIUM FRANKLINII.** Its gigantic growth in the forests of New Zealand contrasts curiously with its diminutive size and tardy development in this country. However, its beauty, even when stunted, entitles it to a sheltered place, which is apparently all the protection it requires.
- DAPHNE PONTICA.** Frosty winds injure it, sometimes vitally ; but, placed amongst taller evergreen shrubs, it is sheltered from the former, whilst it will bear the drip of the latter.
- DESFONTAINEA SPINOSA.** Probably quite hardy, but it is a pity to expose so beautiful a plant to danger, and a little matting in severe frosts will make it safe.
- DESMODIUM PENDULIFLORUM.** It should be trained to a south wall, and screened with matting during frost.
- ELÆAGNUS REFLEXA.** The long shoots are not always ripened, especially in wet autumns. A dry situation suits it best.
- ERICA ARBOREA** and **CODONODES** should be screened from cold easterly winds by a temporary fence.

- ESCALONIA.** The species enumerated are so nearly hardy that in dry soils they scarcely require protection ; but in damp places the young shoots do not ripen their wood, and must be shielded from nipping winds.
- ECRYBIA ILICIFOLIA.** Trained to a wall, this pretty shrub bears our winters very well.
- FAGUS CUNNINGHAMI.** It requires matting-up during severe frosts, a trouble which its pretty evergreen foliage fully repays ; but it is a difficult plant to manage.
- GARRYA.** Both species will do best against a wall, which they will adorn about Christmas with their long pendulous catkins.
- GORDONIA PUBESCENS** requires a warm sunny nook and alight screening in winter.
- GRISELINIA.** Both species are nearly hardy ; but, as they sometimes are killed in severe winters, a mat-screen should be afforded them.
- HELLANTHEMUM SULPHUREUM.** It will thrive well on a sunny bank, and a little litter thrown over it in winter will keep it from harm.
- ILLICITUM.** Both species require a sheltered situation, with a little screening from frosty winds.
- INDIGOFERA DECORA.** It generally dies down in winter, herbaceous-plant fashion ; but some leaf-litter or strawy manure placed over the stool of the plant will easily maintain its vitality during frosty weather.
- JASMINUM REVOLUTUM.** It does not absolutely require, but will thrive and blossom best against, a wall.
- LIGUSTRUM JAPONICUM.** A warm sunny spot (or a low wall) is required to enable it to resist severe frosts, and to stimulate it into free growth and abundant blossom.
- LONICERA SEMPERVIRENS.** It will hardly thrive and flower well unless trained to a south wall.
- MAGNOLIA GRANDIFLORA.** The large leaves and slow growth of this fine evergreen render a wall necessary for it. The warmth stimulates its rather sluggish development, and the shelter preserves the foliage from being cut about by the winds, and also the stems from being rent by the weight of accumulated snow. Otherwise this and all the other species of Magnolia appear to be quite hardy in our climate.
- MYRTUS COMMUNIS.** This favourite grows and flowers freely in the open air, if placed in a warm corner and screened from bleak winds in winter.

- PINUS INSIGNIS.** In an elevated site and in dry soil, this beautiful pine has the best chance of living through our winters, as the long succulent shoots it makes in warmer and damper spots do not always resist our frosts. In any case, it requires to be placed amongst other trees, so as to benefit by their shelter. The mistake has generally been to *coddle* it too much.
- PIPTANTHUS NEPALENSIS.** A little protection during winter is sufficient for this shrub, but if trained to a wall (and its rather straggling habit makes this desirable), no additional care is needed.
- PISTACIA VERA.** This is a native of a hot and arid climate, and requires a dry soil, and in winter protection by matting and litter round the stem.
- PUNICA GRANATUM.** Trained to a south wall with occasional protection "*pro re natâ*" (as the medical phrase is), it will thrive and blossom with us.
- QUERCUS LANATA.** Its fine woolly leaves are so peculiar and ornamental that it fully deserves the screening by mats, etc., which it requires during severe frosts.
- QUERCUS LANCEOLATA.** This fine Mexican variety is rarely killed outright by our frosts, but its summer shoots are so luxuriant and delicate that they die back in winter to nearly the full extent of the annual growth. A dry cool situation to check rank growth, and some screening from glacial winds, constitute the proper treatment.
- RETINOSPORA FILIFERA and FISIFERA.** Lovely plants of slow growth, easily protected by matting from severe weather. They perhaps look more delicate than they really are ; but, till this is ascertained, it is safer to give them shelter.
- RHODODENDRON ARBOREUM** and other Nepal and Sikkim species. These magnificent flowering shrubs are worthy of the most careful treatment. They flourish in their native country under the following conditions :—*1st*, They grow at an elevation greatly above the sea-level, and in some cases nearly approaching the perennial snow-line, but in low latitudes, so that the cold resulting from the altitude of their position is tempered by the heat of the climate, which is within a few degrees of being tropical. *2d*, They grow in a region of cloud, rain, and wind, so that they are almost always surrounded by either a moist or wet atmosphere, and yet from their position in the clefts of rocks or the sides of mountains, the water drains rapidly away from their roots. In

proportion to the closeness with which our cultivation approximates to these conditions will be our success. Up to the present time, although the Himalayan Rhododendrons will for the most part live through our winters, the pretty *R. ciliatum* is the only species which flowers abundantly out of doors. Experience, however, may teach us the way to entice these charming species into growth and blossom with very little occasional protection.

ROBINIA HISPIDA. It is not from frost that this shrub requires to be protected, but from high winds, as its branches are too brittle to resist stormy breezes. So beautiful a plant is quite worthy of a wall or trellis, or, failing these, will do very well in a sheltered nook.

STRAX OFFICINALE. It will only require a little matting round it in very severe winters, as it is very nearly hardy.

THEA VIRIDIS. It is quite as hardy as the Camellia, to which it is nearly allied, and all it requires is a sheltered situation with a little screening from frosty winds.

THUJOPSIS LATE-VIRENS. It is supposed to be hardy, but being a beautiful, valuable, and small-sized shrub, it is advisable to screen it in the depth of winter from biting cold winds.

VELLA PSEUDO-CYTISUS. A little matting, or even dry litter, will save it from the effects of intense frost, under which it occasionally dies.

VERONICA. Both species are found to be hardier than was supposed especially *V. salicifolia*. They are very interesting and ornamental, and deserve every attention. Matting round them, cylinder-shape, with a little fern-litter at the top, will be ample protection.

YUCCA ALOIFOLIA. Perhaps quite hardy, but at all events it will do with very slight protection during intense frosts.

CHAPTER NINTH.

GEOGRAPHICAL DISTRIBUTION OF THE PLANTS DESCRIBED IN THIS WORK.

THE classification of the various species described in this work, in respect to the countries of which they are natives, affords some interesting considerations. It will be seen by the tabular results appended, that of the 621 species enumerated, only 72 are indigenous to Great Britain and Ireland, so that if we confined ourselves to the productions of our own islands, our gardens, plantations, and forests would be furnished with only one-ninth of the trees and shrubs which our climate and soil allow us to cultivate, even after eliminating an immense number which are omitted in this work as being the least worthy of attention. Our ancestors commenced pretty early the task of introducing foreign trees and shrubs, and a few of the most useful and ornamental were in cultivation in the middle of the sixteenth century. But botany was then in its infancy, travellers were few and unscientific, and the means of intercommunication were scanty and costly. It cannot therefore be a matter of surprise if the introduction of new plants proceeded then at a much slower pace than at a later period. But it is within the last fifty years that the power of procuring has fully ministered to the desire of possessing every plant of exotic growth that was valuable, either for its usefulness, its beauty of flower or foliage, its singularity, or its other sources of interest. Of these by far the greater number consists of plants requiring either hothouse or greenhouse culture. But, as the selection given in this work evinces

a multitude of hardy or nearly hardy trees and shrubs have by this time been introduced into this country, of which a considerable proportion fully deserve thorough domestication. Our ancestors effected this in the case of their limited number of hardy exotics, but it has by no means been yet done in respect to the numerous plants of recent introduction. China and Japan alone have contributed to this work more trees and shrubs than are indigenous to this country, and North America nearly three times as many. Europe and America furnish about an equal quota (Europe 210, America 239), and Asia very nearly the residue. Africa supplies but one tree (the *Cedrus Atlantica*), and Australia eleven, most of which require favourable conditions to enable them to resist our winters. As regards Australian plants, however, further experiments are needed. It is premature to place them all in the category of tender plants, whilst a myrtaceous shrub like the *Leptospermum laevis*, and a proteaceous shrub like the *Lomatia longifolia*, are found to be tolerably hardy. If these will bear our winters, why not many others? There is no argument *à priori* conclusive in such cases, and patient verification from actual trial can alone give us decisive results.

Of the 89 species enumerated as introduced from China and Japan, it may be interesting to note, 1st, That a larger proportion of them are evergreen than in any other section; 2^d, That a larger proportion of them are with variegated foliage than in any other section; and 3^d, That of the flowering plants, many come into blossom at a very early period (for example, the Camellia, Chimonanthus, Cydonia, Forsythia, Kerria, Paulownia, etc.) The latter circumstance is no doubt owing to the suddenness and completeness with which, in China and Japan, genial spring succeeds the severity of the winter, whilst, on the other hand, the severity of the winter in those countries prepares their plants for endurance in our climate. There is this difference, therefore, that, whilst

their winter is very cold, yet the transition to vernal warmth is sudden, decided, and permanent; whereas in our climate the extreme cold of winter is less, but our spring is capricious, and mingles icy chills with balmy breezes, so that the early development of leaves and flowers, natural to the indigenes of China and Japan, exposes them to injury from our keen scorching "Etesian easterlies."

From the north-western region of America (California, etc.) we have selected 32 species, most of them Coniferæ. Of these about three-fourths are evergreen, and amongst them are to be found some of the most gigantic, imposing, distinct, and interesting species. The most suggestive of all is the *Wellingtonia gigantea*, which, from its exceptional height and bulk, as well as from the rarity of its occurrence, would almost seem to claim kindred with a state of things anterior to the existing races of the animal and vegetable kingdoms. One of the Wellingtonias, composing that wonderful grove of 103 trees at Calaveras, in California, measured 110 feet in circumference at the base near the roots, from thence it rose 200 feet to the first branch, and its total height when it fell (for the measurements were taken after its fall) was upwards of 400 feet. Now, the tallest tree ever seen either before or after the discovery of the Wellingtonia has not exceeded 250 feet. Many specimens (of *Abies Douglassii*, *Pinus Lambertiana*, etc.) have been found ranging between 200 to 240 feet in height. But between this and the enormous altitude of 400 feet there appears to exist nothing in the vegetable kingdom. The links are missing to connect the tallest tree previously known with the enormous, or, we might say, abnormal stature of the Wellingtonia. No wonder that this stupendous tree, proving as it does hardy in our climate, should have attracted so much attention, and been so freely planted.

Pity that the name should still be an object of contention. Dr. Lindley, on ascertaining its generic distinctness from any

other known tree, named it *Wellingtonia gigantea*. On the other hand, our American brethren thinking (naturally enough) that so characteristic a tree, growing in their own country, and first brought to notice by one of themselves, ought to illustrate the name of one of their own celebrities, named it the *Washingtonia gigantea*; whilst Endlicher and the Continental authorities, fearful no doubt of offending one of the two contending parties, and, as usual with trimmers, conciliating neither, have named it (erroneously) the *Sequoja gigantea*. Botanical etiquette, which knows no distinction of names or countries, goes with Dr. Lindley and *Wellingtonia*; and if the two great men whose names are in question were still living, and it were left to them to decide, who can doubt but that they would smile at the puerility of the dispute, and leave abstract science to settle it?

Of the 23 species enumerated as originating in Asia Minor and Persia, it is remarkable how large a proportion consists of fruit-trees. Amongst them are the *Amygdalus* (*Almond*), *Castanea* (*Chestnut*), *Cerasus* (*Cherry*), *Corylus* (*Nut*), *Ficus* (*Fig*), *Juglans* (*Walnut*), *Morus* (*Mulberry*), etc.—a contribution valuable not only for its utility, but equally so for purposes of mere ornament.

It may also be interesting to note that a majority of the Siberian species have their leaves clothed with white silvery down. This hoary appearance distinguishes most plants growing in soils impregnated with saline or nitrous particles, as are large portions of the steppes of Siberia. Some of the shrubs indicated (such as *Nitraria Schoberi*, etc.) actually require occasional doses of salt applied to the soil round the roots in order to thrive well.

Of the 14 genera noted in this work as from Chili and Peru, it is observable that not one is indigenous to Europe. Most of them are pretty flowering shrubs, only three being coniferous; and of these, only one (the *Araucaria*) is of any considerable dimensions.

Those fertile states that form the eastern seabord of America, extending from the 28th to the 38th degree of latitude, and including Virginia, the two Carolinas, Georgia, and Florida, contribute 35 species to our collection. These all prove with us hardy or nearly so. But, strange to say, there is not a single coniferous species amongst them ; whereas, on the western seabord of the American Continent, between the same degrees of latitude, out of the 38 species which have been selected from that region, no less than 23 are conifers. Whence this remarkable contrast ? What are the conditions under which the western flora abounds with conifers, and the eastern regions of the same continent, and within the same limits of latitude, whilst rich in other vegetable products, are quite poor in members of the coniferous family ?

The large *foci* for hardy conifers are—1st, The regions just indicated in the western parts of America ; 2^d, Canada and the more northern parts of East America ; 3^d, China and Japan ; and 4th, The central and southern parts of Europe. Of the 90 species described in this work, no less than 70 are derived from these four sources, and the remaining 20 are scattered amongst the other regions of the globe. It must, however, be borne in mind that these remarks only apply to those coniferous plants which are sufficiently hardy to thrive in our climate. For instance, not a single Mexican Pine has been included, on account of their being, with the possible exception of the *Pinus Montezumæ*, too tender to live with us ; but Mexico is exceedingly rich in coniferous vegetation, and would contribute a large item to calculations founded on general botanical considerations alone. The number of species indigenous to Mexico, coming under the conditions to which we have restricted this work, only amounts to six, and none of these are coniferous. But when we call to mind that Mexico lies between the 20th and 30th degree of latitude, that its more northern parts are no farther from the tropic of Cancer. than is New Orleans, whilst its

southern extremity is actually intertropical, the wonder is that any single one of its native plants should be able to withstand our climate, except under glass. The single circumstance that renders it feasible for a denizen of the same latitude as that which nurtures the sugar-cane and cotton plant, to live in the open air in England, is the very great altitude of the Mexican plateau. Of course, the indigenes of the "terra caliente" or lower regions of the country, would hardly live here even in July or August, and would not stand a single chilly, not to say frosty night; but the temperature of the high table-lands of Mexico, averaging, as they do, several thousand feet above the level of the sea, approximates very much to that of South Europe. Hence the curious anomaly of such plants as *Crataegus Mexicana* and *Quercus lanceolata* resisting at once the heat of Mexico and the cold of England.

Some genera extend their habitats over very extensive districts and very diversified temperatures,—in other words, enjoy a wide geographical range. As an instance, the *Betula nana* is indigenous to Lapland and lives nearer to the pole than any other ligneous plant, whilst its congener the *Betula Bhojputtra* is a native of Kamaon in India. The Acers (Maples) are to be found in almost every region. Of the 19 species of the latter described in this volume, 8 are European, having their habitats from Norway to Candia; 4 are Asiatic, residing in Nepal, the Himalayan range, and Japan; and 7 are American, inhabiting the temperate and northern zones of that continent.

These and several other interesting inferences are deducible from the geographical classification of even the limited number of species here collected. He who shall undertake to apply a similar or more elaborate process of classification, analysis, and inference, to the entire range of known plants, will have engaged in a labour of herculean proportions, but pregnant with important results.

LIST 37.

GEOGRAPHICAL DISTRIBUTION OF THE GENERA AND SPECIES
DESCRIBED IN THIS WORK.

N.B.—To the name of each genus is added the number of species of such genus coming under each division.

EUROPE.

GREAT BRITAIN AND IRELAND.—*Acer* 1, *Alnus* 1, *Andromeda* 1, *Androsæmum* 1, *Arbutus* 1, *Arctostaphylos* 1, *Azalea* 1, *Betula* 1, *Buxus* 1, *Calluna* 1, *Carpinus* 1, *Cerasus* 2, *Chenopodium* 1, *Corylus* 1, *Cratægus* 1, *Dabæcia* 1, *Daphne* 2, *Empetrum* 1, *Erica* 3, *Euonymus* 1, *Fagus* 1, *Fraxinus* 1, *Hedera* 1, *Hippophaë* 1, *Hypericum* 1, *Ilex* 1, *Juniperus* 2, *Ligustrum* 1, *Linnæa* 1, *Lonicera* 1, *Mespilus* 1, *Myrica* 1, *Phyllodoce* 1, *Pinus* 1, *Populus* 4, *Potentilla* 1, *Pyrus* 3, *Quercus* 2, *Rhamnus* 2, *Rosa* 1, *Rubus* 1, *Salix* 7, *Staphylea* 1, *Tamarix* 1, *Taxus* 1, *Tilia* 1, *Ulmus* 4, *Vaccinium* 1, *Viburnum* 1, *Vinca* 1, *Viscum* 1.

51 Genera, 72 Species.

NORTH EUROPE GENERALLY.—*Abies* 1, *Acer* 2, *Betula* 1, *Cassiope* 1, *Salix* 1.

5 Genera, 6 Species.

FRANCE.—*Astragalus* 1, *Clematis* 1, *Cratægus* 1, *Ephedra* 1, *Erica* 1, *Ononis* 1, *Periploca* 1, *Punica* 1, *Quercus* 2, *Santolina* 1.

10 Genera, 11 Species.

GERMANY.—*Colutea* 1, *Cornus* 1, *Cydonia* 1, *Cytisus* 1, *Euonymus* 1, *Myricaria* 1, *Pinus* 2, *Polygala* 1, *Rhododendron* 1.

9 Genera, 10 Species.

HUNGARY.—*Acer* 1, *Alnus* 1, *Syringa* 2, *Tilia* 1.

4 Genera, 5 Species.

SWITZERLAND AND THE ALPS.—*Abies* 1, *Daphne* 1, *Genista* 1, *Juniperus* 1, *Larix* 1, *Pinus* 1, *Rhododendron* 1.

7 Genera, 7 Species.

SPAIN AND PORTUGAL.—*Abies* 1, *Adenocarpus* 1, *Artemisia* 1, *Atriplex* 1, *Bupleurum* 1, *Buxus* 1, *Cerasus* 1, *Cistus* 1, *Clematis* 1,

Corema 1, Cytisus 2, Daphne 1, Erica 2, Genista 1, Helianthemum 3, Juniperus 1, Phlomis 1, Quercus 2, Ruscus 1, Spartium 1, Vella 1.
21 Genera, 26 Species.

ITALY, SICILY, ETC.—Acer 1, Alnus 1, Cytisus 1, Erica 1, Genista 1, Helianthemum 1, Laurus 1, Ostrya 1, Pinus 2, Populus 1, Ruscus 1.
11 Genera, 12 Species.

GREECE AND THE LEVANT.—Abies 1, Acer 1, Amygdalus 1, Arbutus 1, Azalea 1, Cistus 2, Cratægus 2, Daphne 1, Iberis 1, Jasminum 1, Platanus 1, Quercus 2, Rosa 1.
13 Genera, 16 Species.

SOUTH RUSSIA.—Acer 1, Amygdalus 1, Planera 1, Pterocarya 1, Rosa 1, Spiræa 1, Ulmus 1.

7 Genera, 7 Species.

CENTRAL AND SOUTH EUROPE GENERALLY.—Acer 1, Anthyllis 1, Celtis 1, Cercis 1, Cineraria 1, Coriaria 1, Coronilla 1, Cratægus 1, Cupressus 1, Cytisus 2, Elæagnus 1, Erica 1, Helianthemum 1, Hypericum 1, Juniperus 1, Lavandula 1, Lycium 1, Myrtus 1, Ornus 1, Paliurus 1, Philadelphus 1, Phillyrea 3, Pinus 2, Quercus 2, Rhamnus 1, Rhus 1, Ribes 1, Ruta 1, Salix 1, Sambucus 1, Viburnum 1, Vitis 1, Vitex 1.

33 Genera, 38 Species.

ASIA.

ASIA MINOR AND SYRIA.—Abies 1, Æsculus 1, Amygdalus 1, Armeniaca 1, Castanea 1, Cedrus 1, Cerasus 1, Corylus 1, Daphne 1, Diospyros 1, Ficus 1, Fontanesia 1, Hibiscus 1, Jasminum 1, Pistacia 1, Rhododendron 1, Salix 1, Styrax 1.

18 Genera, 18 Species.

PERSIA.—Acacia 1, Amygdalus 1, Juglans 1, Morus 1, Syringa 1.

5 Genera, 5 Species.

SOUTH SIBERIA AND TARTARY.—Atraphaxis 1, Calophaca 1, Caragana 3, Diotis 1, Halimodendron 1, Juniperus 1, Nitraria 1, Pyrus 1, Rhododendron 1, Spiræa 3, Tragopyrum 1.

11 Genera, 15 Species.

NEPAL AND BHOTAN.—Acer 1, Benthamia 1, Cotoneaster 3, Hedera 1, Hypericum 1, Jasminum 1, Juniperus 1, Leycesteria 1, Mahonia 1,

Pinus 1, Piptanthus 1, Quercus 1, Rhododendron 2, Skimmia 1, Spiræa 1, Viburnum 1.

16 Genera, 19 Species.

HIMALAYAN RANGE GENERALLY.—Abies 3, Acer 1, Berberis 1, Betula 1, Cedrus 1, Desmodium 1, Elæagnus 1, Fraxinus 1, Polygonum 1, Rhododendron 1, Spiræa 1, Syringa 1.

12 Genera, 14 Species.

CHINA AND JAPAN.—Acer 2, Ailantus 1, Akebia 1, Ampelopsis 1, Aralia 2, Aucuba 1, Bambusa 1, Biota 2, Broussonetia 1, Camellia 1, Cephalotaxus 1, Chamærops 1, Chimonanthus 1, Clematis 2, Cryptomeria 2, Cunninghamia 1, Cupressus 1, Cydonia 1, Deutzia 2, Elæagnus 1, Euonymus 3, Exochordia 1, Forsythia 2, Gleditschia 2, Glyptostrobus 1, Hydrangea 1, Ilex 2, Illicium 1, Indigofera 1, Jasminum 1, Juniperus 2, Kerria 1, Kolreuteria 1, Ligustrum 2, Lonicera 3, Magnolia 2, Mahonia 1, Morus 1, Olea 1, Osmanthus 1, Pæonia 1, Paulownia 1, Photinia 1, Planera 1, Podocarpus 1, Prunus 2, Pseudolarix 1, Pyrus 1, Quercus 1, Raphiolepis 1, Retinospora 4, Rosa 1, Salisburia 1, Sciadopytis 1, Serissa 1, Skimmia 2, Sophora 1, Spiræa 1, Taxodium 1, Taxus 1, Thea 1, Thuiopsis 2, Viburnum 2, Weigelia 2, Wistaria 1.

65 Genera, 89 Species.

AFRICA.

ATLAS MOUNTAIN RANGE.—Cedrus 1.

1 Genus, 1 Species.

AMERICA.

NORTH-EASTERN STATES AND CANADA.—Abies 3, Acer 5, Æsculus 2, Amelanchier 1, Amorpha 1, Ampelopsis 1, Aristolochia 1, Asimina 1, Azalea 2, Baccharis 1, Betula 3, Bignonia 1, Borya 1, Carpinus 1, Carya 4, Cassandra 1, Catalpa 1, Ceanothus 1, Celtis 2, Cephalanthus 1, Cerasus 2, Chamæcyparis 1, Chionanthus 1, Clethra 2, Comptonia 1, Cornus 2, Cratægus 6, Diervilla 1, Diospyros 1, Elæagnus 1, Epigæa 1, Fagus 1, Fothergilla 1, Fraxinus 1, Gaultheria 2, Gymnocladus 1, Hamamelis 1, Hydrangea 1, Ilex 1, Itæa 1, Juglans 2, Juniperus 2, Kalmia 2, Larix 1, Laurus 1, Ledum 1, Liquidambar 1, Liriodendron 1, Lonicera 1, Lyonia 2, Maclura 1, Magnolia 4, Menispermum 1, Morus 1,

Myrica 1, *Negundo* 1, *Nyssa* 1, *Oxycoccus* 1, *Panax* 1, *Pavia* 1, *Philadelphus* 2, *Pinus* 4, *Platanus* 1, *Populus* 4, *Prinos* 1, *Ptelea* 1, *Pyrus* 1, *Quercus* 8, *Rhodora* 1, *Rhus* 2, *Robinia* 1, *Rubus* 1, *Salix* 1, *Shepherdia* 1, *Smilax* 2, *Spiræa* 1, *Staphylea* 1, *Symphoricarpus* 1, *Taxodium* 1, *Thuja* 1, *Tilia* 1, *Ulmus* 1, *Vaccinium* 1, *Viburnum* 1, *Virgilia* 1, *Vitis* 1, *Xanthorrhiza* 1, *Xanthoxylum* 1, *Yucca* 1.

89 Genera, 135 Species.

NORTH-WESTERN STATES (CALIFORNIA, etc.)—*Abies* 6, *Acer* 2, *Arbutus* 1, *Calycanthus* 1, *Castanea* 1, *Cupressus* 3, *Lonicera* 1, *Mahonia* 1, *Myrica* 1, *Oreodaphne* 1, *Pavia* 1, *Pinus* 8, *Ribes* 3, *Rubus* 1, *Sequoia* 1, *Spiræa* 1, *Thuja* 3, *Torreya* 1, *Wellingtonia* 1.

19 Genera, 38 Species.

CAROLINA, VIRGINIA, GEORGIA, FLORIDA, etc.—*Ammyr sine* 1, *Amorpha* 1, *Andromeda* 1, *Aralia* 1, *Bumelia* 1, *Calycanthus* 1, *Cerasus* 2, *Cratægus* 1, *Dirca* 1, *Garrya* 1, *Gleditschia* 1, *Gordonia* 1, *Halesia* 2, *Hydrangea* 2, *Illicium* 1, *Laurus* 1, *Leucothoe* 1, *Magnolia* 2, *Malachodendron* 1, *Menziesia* 1, *Pavia* 2, *Populus* 1, *Quercus* 1, *Rhododendron* 1, *Robinia* 2, *Stuartia* 1, *Tecoma* 1, *Yucca* 1, *Zenobia* 1.

29 Genera, 35 Species.

MEXICO.—*Berberis* 1, *Ceanothus* 2, *Cratægus* 1, *Garrya* 1, *Quercus* 1.

5 Genera, 6 Species.

CHILI AND PERU.—*Aloysia* 1, *Araucaria* 1, *Aristotelia* 1, *Berberidopsis* 1, *Buddlea* 1, *Colletia* 1, *Desfontainea* 1, *Escallonia* 2, *Eugenia* 1, *Grabowskia* 1, *Lardizabala* 1, *Libocedrus* 1, *Passiflora* 1, *Podocarpus* 1.

14 Genera, 15 Species.

PATAGONIA, TIERRA DEL FUEGO, AND FALKLAND ISLANDS.—*Berberis* 3, *Escallonia* 1, *Fagus* 1, *Pernettya* 1, *Veronica* 1.

5 Genera, 7 Species.

OTHER PARTS OF SOUTH AMERICA.—*Escallonia* 1, *Solanum* 1, *Yucca* 1.

3 Genera, 3 Species.

AUSTRALIA.

SOUTHERN PARTS OF NEW HOLLAND, VAN DIEMEN'S LAND, AND NEW ZEALAND.—*Acacia* 2, *Dacrydium* 1, *Eurybia* 1, *Fagus* 1, *Grisebinia* 2, *Leptospermum* 1, *Lomatia* 1, *Podocarpus* 1, *Veronica* 1.

9 Genera, 11 Species.

SUMMARY.

	Genera.	Species.	
EUROPE—			
Great Britain and Ireland	51	72	
Other parts of North Europe	5	6	
France	10	11	
Germany	9	10	
Hungary	4	5	
Switzerland and the Alps	7	7	
Spain and Portugal	21	26	
Italy, Sicily, etc.	11	12	
Greece and the Levant	13	16	
South Russia	7	7	
Central and South Europe generally	33	38	
		210	210
ASIA—			
Asia Minor and Syria	18	18	
Persia	5	5	
South Siberia and Tartary	11	15	
Nepal and Bhotan	16	19	
Himalayan range generally	12	14	
China and Japan	65	89	
		160	160
AFRICA—			
Atlas mountain range	1	1	1
AMERICA—			
North-Eastern States and Canada	89	135	
North-Western States (California, etc.)	19	38	
Carolina, Virginia, Georgia, Florida, etc.	29	35	
Mexico	5	6	
Chili and Peru	14	15	
Patagonia, Tierra del Fuego, and Falkland Islands	5	7	
Other parts of South America	3	3	
		239	239
AUSTRALIA—			
Southern parts of New Holland, Van Diemen's Land, and New Zealand	9	11	11
Total of Species described in this volume . . . . .	...	...	621

CHAPTER TENTH.

CLASSIFICATION OF THE SPECIES ACCORDING TO THEIR NATURAL ORDERS — LAWS OF ACCLIMATISATION — INFLUENCE OF EQUABLE TEMPERATURE—OF ALTITUDE—OF ARTIFICIAL CULTIVATION.

WHAT is the total number of the species composing the vegetable world throughout our globe? To this interesting question no strictly accurate answer can yet be given, and a conjectural estimate alone can be formed. Several botanists have directed their attention to this inquiry, but, as might have been expected, their estimates have widely differed. They range from 200,000 to 300,000. The English school have adopted the smaller number as the most probable, and we think on good grounds, as, when we reflect that the described species are, in round numbers, 100,000, and that most regions of the earth have been ransacked by botanical travellers, it hardly appears likely that more than another 100,000 species remain undiscovered and undescribed. In some degree the investigation is complicated by another vexed and intricate question—"What is a species?" The Crab and the Golden Pippin Apple ;—the *Armeniaca Brigantiaca* and the Moor Park Apricot ;—the *Géant des Batailles* and *Gloire de Dijon* Roses—have many striking points of dissimilarity, and yet they do not constitute different species. On the other hand, many so-called species merge into each other so insensibly, that, although scientifically adjudged to be distinct, it is difficult to define their points of difference. The writer, possessing a large collection of exotic ferns, cultivated in pots, placed about forty species of *Asplenium* in a

continuous line, commencing with the broad-leaved sorts, and tapering off gradually to those with minutely-divided leaves. Thus arranged, the gradations of difference were so imperceptible, that, whilst the two species at the extreme ends of the line were quite aberrant, and hardly seemed to belong to the same genus, the distinctions between any two contiguous individuals forming the series were hardly appreciable, and it was very difficult at any point to draw the line of specific divergence.

But leaving this large and intricate question, and inclining rather to a reluctance to break up orders into too many genera, or genera into too many species, let us assume the Vegetable Kingdom or the World's Flora to consist of 200,000 species. Of these, about half (nearly 100,000 species) have, up to this time, been examined and described by botanists, and sorted, first into genera, and then the genera into groups called Orders, conformably with certain points of accordance between them. This process of classification has distributed the 100,000 species into about 10,000 genera, and has further re-distributed the 10,000 genera into from 200 to 300 Natural Orders, the numbers varying according to the systems adopted by different botanists. For the purposes of this work we shall adopt the classification of Dr. Balfour, which fixes the number of Natural Orders at 276.

Looking from another point of view at the 100,000 plants which are known and described, we find that one-seventh (or about 14,000 species) consist of Cryptogamic or non-flowering plants, such as the Filices (Ferns), Musci (Mosses), Algæ (Sea-weeds), Fungi (Mushrooms), and a few other flowerless families. These flowerless plants (the "lower classes" of the vegetable world) form fewer large central groups, whether as genera or orders, than the more highly organised flowering (or Phanerogamous) plants. Out of the total 276 orders which comprise all the plants at present

known, the 14,000 Cryptogams only absorb 10, leaving 266 to represent the 86,000 flowering species. It follows, as a necessary consequence, that, in the case of non-flowering as compared with flowering plants, the subsidiary groups are individually larger, and thus, whilst the genera comprising each order are more numerous, the genera themselves abound in large numbers of species. Accordingly, we find that, in Fungi, the genus *Agaricus* alone comprises nearly 1000 species; and in Ferns, the sub-order *Polypodiaceæ* includes upwards of 2000.

To revert to the 86,000 flowering (*Phanerogamous*) plants, with which alone we are here concerned, and to their ultimate division (through genera) into 266 Natural Orders, what interests us chiefly is to ascertain how many of these orders are represented by the 621 trees and shrubs enumerated in the present work. By the detailed analysis which follows, it will be seen that the collection of ligneous plants described in this volume offers types of no less than 84 Natural Orders. But to gain a clear conception of the large proportion this bears to the totality, it must be borne in mind that 72 orders out of the 266 contain no ligneous species whatever, and therefore must be entirely omitted from an analysis in which trees and shrubs alone are involved.* This leaves 194 orders, of which trees and shrubs form component members; and of

* To satisfy any doubts as to there being as many as seventy-two Natural Orders of *Phanerogamous* plants, of which no member is a tree or shrub, the following enumeration will no doubt be sufficient. Forty-nine orders are composed only of herbaceous plants, viz.—1. *Alismaceæ*; 2. *Amaryllidaceæ*; 3. *Apostasiaceæ*; 4. *Balsaminaceæ*; 5. *Begoniaceæ*; 6. *Brunoniaceæ*; 7. *Burmanniaceæ*; 8. *Calyceraceæ*; 9. *Cannaceæ*; 10. *Caryophyllaceæ*; 11. *Commelynaceæ*; 12. *Cucurbitaceæ*; 13. *Cyperaceæ*; 14. *Desvauxiaceæ*; 15. *Dipsacaceæ*; 16. *Droseraceæ*; 17. *Fumariaceæ*; 18. *Hypoxidaceæ*; 19. *Iridaceæ*; 20. *Juncaceæ*; 21. *Juncagineæ*; 22. *Limnanthaceæ*; 23. *Linaceæ*; 24. *Loasaceæ*; 25. *Mayaceæ*; 26. *Mesembryanthemaceæ*; 27. *Musaceæ*; 28. *Nepenthaceæ*; 29. *Orchidaceæ* (with rare exceptions); 30. *Orontiaceæ*; 31. *Papaveraceæ*; 32. *Pedaliaceæ*; 33. *Plantaginaceæ*; 34. *Polemoniaceæ*; 35. *Portulacaceæ*; 36. *Primulaceæ*; 37. *Pyrolaceæ*; 38. *Resedaceæ*; 39.

these nearly one-half (or, with arithmetical precision, four-ninths) are represented by species which will grow with us in the open air.

It cannot but appear surprising, if not anomalous, that this country,—a tract of land that forms so small a segment of the terrestrial area of that great globe which we call our earth—embracing, as it does, only 9 degrees of latitude and 11 of longitude,—should enjoy the privilege of growing within its limits representatives of nearly one-half of the Natural Orders containing ligneous plants. But the law of acclimatisation is modified by some very special and interesting conditions, amongst which the following may, in particular, deserve notice :—

1. The great variability of summer heat and winter cold as resolved into the same annual average temperature.

2. The influence of altitude in correcting the influence of mere latitude.

3. The unexplained connection between artificial cultivation and, generally, between changes of surface occasioned by excavations, fire or forest-cutting, on the one hand, and the spontaneous appearance, after such processes, of new plants on the same site on the other.

A few remarks may be allowable on each of these topics.

I. *Average temperature as resulting from a large or small*

Sarraceniacæ; 40. Saussuracæ; 41. Scitamineæ; 42. Scleranthacæ; 43. Stackhousiacæ; 44. Stellatæ; 45. Tetragoniacæ; 46. Trilliaceæ; 47. Tropæolacæ; 48. Valerianiacæ; 49. Xyridacæ. The following fourteen orders comprise aquatic herbs alone, viz.—50. Butomacæ; 51. Cabombacæ; 52. Callitrichacæ; 53. Ceratophyllacæ; 54. Haloragiaceæ; 55. Hydrocharidacæ; 56. Lentibulariacæ; 57. Naiadacæ; 58. Nelumbacæ; 59. Nymphaacæ; 60. Pistiacæ; 61. Podostemoniacæ; 62. Pontederiacæ; 63. Triuridacæ. We now come to six orders composed entirely of parasitic plants, viz.—64. Balanophoracæ; 65. Cuscutacæ; 66. Cytinacæ; 67. Monotropacæ; 68. Orobanchæ; 69. Rafflesiaceæ. Two orders are confined to bulbous plants, viz.—70. Gilliesiacæ; 71. Melanthacæ. And one order contains none but annuals, viz.—72. Elatinæ.

range between summer and winter extremes.—England, and, as a rule, all islands, enjoy a comparatively equable temperature. From a variety of causes, our winters are less cold and our summers are less hot than in most other regions in which the same average temperature prevails. As types of the opposite extreme, New York and Pekin may be adduced, in which towns the average temperature, which is moderate, is compounded of Siberian cold in winter and tropical heat in summer. Again, in Central Germany, where the July sun burns and the January frosts are intense, plants which are pretty hardy in England, but are sensitive to severe cold, refuse to live out of doors. But, in the same spot, cherries ripen by the end of June, whilst with us the sun's more tempered rays only produce them between the 20th and 25th July. Again, near Upsal, in a latitude 9 degrees north of that of London, barley ripens on an average ten days earlier than in England. Many other curious deviations from our British plant-calendar result from very cold long winters and very hot short summers.

But it is not by heat alone that vegetation is affected, but also by moisture. Immense tracts of land in the interior of large continents are desiccated, and consequently all but devoid of vegetable life. Central Asia—that enormous desert bounded to the west by China Proper, to the north by the Altai mountains, and to the south by the mighty Himalayas; Central Africa—the entire continent, deducting a band of a few hundred miles' depth of seaboard, and the valleys of a few large rivers; the centre of North America, extending from the north-east of Utah to Hudson's Bay; and the centre of South America, comprising the illimitable wastes of the Pampas, which a few genera monopolise to the exclusion of all others; Central Australasia, to the recesses of which man has not yet been able to penetrate;—all these regions, forming no small proportion of the total area of that part

of our globe which is at present (and probably for the present) above the level of the sea, are stricken with irredeemable barrenness from the absence of moisture. Central Europe has escaped this ban by reason of the seas which deeply indent its coasts to the north, east, and south, and of the mighty rivers which fertilise the eastern provinces of European Russia.

Great Britain is peculiarly favoured in respect to moisture by its insular position. Indeed, in some of the north-western counties, it is in excess. But, on the whole, our climate possesses many advantages calculated to make this country the habitat of an abundant and varied flora.

But, besides the two predominant climatic influences of heat and moisture, a number of subordinate conditions are (like under-currents in the ocean) working with greater or lesser powers of modification. With every desire to be concise, the most important of these must be succinctly adverted to.

1. Soil and Subsoil.—These are powerful agents in promoting or retarding the growth of plants.

2. Exposure to the Wind.—Many plants will not withstand violent gales; many, especially on the sea-shore, get twisted and warped in the direction of the wind; others are morbidly sensitive only to the northerly and easterly blasts; others (and curiously enough the less hardy ones chiefly) will perish in valleys and close situations, from frosts which will not affect them in higher and more open spots.

3. Cultivation.—Many shrubs will flourish, provided they be protected when young from the overpowering competition of weeds (*i.e.* native plants), and provided the soil immediately above the radius to which the roots extend be kept clear. Otherwise these will wither away under the irrepressible luxuriance of the indigenes to the soil. But whenever such plants have once overtopped the weeds they are safe.

4. Proximity to Mountain Chains.—The vicinity of mountains varies in its effects on plants, according to their position

in respect to the direction of the winds prevailing in the district. In some cases, mountains are a protection from cold, and in others they drive currents of glacial wind upon the vegetation within their influence.

5. The agency (long proclaimed, recently disputed, and not yet settled) of the Gulf Stream upon the temperature of our south-western coasts.—But, whether derived from that or from some other local cause, the fact remains undisputed, that those of our counties whose shores are lashed by the gigantic waves of the Atlantic are the most temperate in their climate, and will rear plants that prove tender in other parts of our islands. Several species peculiar to the west of Ireland (*Dabæcia polifolia*, *Arbutus unedo*, etc.) are found again as indigenous to the western parts of Spain. Hence, besides the obvious one of climatic sympathy, certain geological inferences are drawn, which, however interesting, must here be pretermitted.

6. Elevation.—This is intended as referring to mere hills, and not to mountain altitudes, which are elsewhere specially adverted to. Even slight undulations in a country affect its indigenous flora, and, *à fortiori*, plants introduced from other countries.

7. Proximity to the Sea.—This affects different plants in different ways and degrees. A larger proportion of evergreen than of deciduous shrubs flourishes under the influence of sea-breezes, but to the vast majority of species of all kinds they are detrimental, both from the saline particles which they convey, and from their mechanical violence.

8. Ratio of Cloud and Sunshine.—There is a considerable difference in this respect between places in comparatively close proximity, arising from the configuration of the land, and from other local causes. As a rule, there is more sunshine and less moisture on the eastern shores of our island than on the western, but on the latter the frosts are less intense, and the extreme range of the thermometer smaller. The general

effects on plants of this difference appears to be a predominance of leaf-growth in the west, and of seed-elaboration in the east. As types may be adduced Devonshire pastures, in contrast with the wheat-fields of Lincolnshire.

From what precedes, it will be easily inferred that isothermal lines, indicative of equal mean annual temperatures, are very deceptive guides when considered in relation to the hardiness of plants. A multitude of other circumstances control and modify those deductions, which are derived merely from the readings of the thermometer.

We have now, *secondly*, to consider—

The Influence of Altitude in modifying the Results of Latitude.—As we penetrate towards the centre of the earth (as in mines, etc.) heat increases; as we recede from it (as on the tops of mountains) heat decreases. In both cases the ratio of change is wonderfully rapid, considering the insignificance of the heights and depths reached, as compared with the diameter of the globe. The ratio is, on an average, one degree (Fahrenheit) for every 350 feet we ascend above the level of the sea. At this rate, what would be the temperature, respectively, 50 miles away from the earth, or 50 miles down towards its centre? How far the explanations of these phenomena, hitherto attempted by physicists, may be deemed satisfactory, is a question with which we have nothing to do here. Our business is with the fact, and its effects upon the life of plants.

A lofty mountain within the tropics, if we take its vegetation at different altitudes, presents, in certain respects, an epitome of the world's flora, ending at its highest zone by typifying the total barrenness of the Polar regions. In the very hottest equatorial districts, it is too cold, at a height exceeding three miles above the level of the sea, for any plant whatsoever to live. From that point downwards, such is the

intimate connection between climate as affecting plants and verticality of location, that the vegetation varies in character at every thousand feet. The average latitude of the Himalayan mountain-range is 30° N., corresponding with that of Cairo in Egypt, a portion of the Desert of Sahara, the Canary Islands, and New Orleans in America. Yet, at an altitude of 10,500 feet (about two miles), the vegetation of the Himalayas is very similar to that of England, and almost all the plants native to that region (amongst which are the well-known *Cedrus Deodara* and *Pinus excelsa*) will stand the winters of our climate. Again, in the Swiss Alps, at an altitude of 1500 to 2000 feet, the violet blossoms in the first week of April. On the same mountains, at the height of 6000 to 7000 feet, the earliest spring blossoms expand at the beginning of June.

Thus, tropical plants may and do prove hardy with us if indigenous to great altitudes. *Betula Bhojputtra*, which thrives freely with us, refuses to grow in the Himalayas higher than 11,500 feet, which, after all, it may be remarked, is 7000 below the line of perpetual snow. In the same manner the very hardiest plants have their limits in the mountains of Europe. On the Pyrenees the *Pyrus aucuparia* (the Mountain Ash) will only live up to 6000 feet; the *Abies picea* to 6400; the *Abies excelsa* to 8000; whilst the sturdy little *Rhododendron ferrugineum* (the Alpine Rose) bravely ascends as high as 8300 feet, but beyond that lives not.

Some orders are very numerous distributed in congenial climates, whilst they are comparatively rare outside of those limits. The two multitudinous orders, Cruciferae (Cabbage, Cressworts, etc.) and Umbelliferae (Carrots, Hemlocks, Carraways, etc.), both strongly affect the temperate zone. The Cruciferae form 1-18th part of the total vegetation in temperate regions, and only 1-800th part of that within the tropics. Similarly the Umbelliferae compose 2½ per cent of the plants in the temperate regions, but only 1-5th per cent

of those within the tropics.* At the altitude of 12,000 feet, on the Mexican volcanic mountains, many Cruciferae are indigenous, and thus, whilst growing within the tropics, they represent the flora of the temperate zone. About 2000 feet below them (a difference equivalent to a mean of 6 degrees Fahrenheit), the *Pinus Montezumae* and *Abies religiosa* begin to appear, and these are barely hardy in our climate.

Enough has been said to make it evident that vertical elevation exercises a very considerable influence over the acclimatisation of plants; and that, were it not for those insignificant inequalities on the earth's surface which we call mountains, the introduction of species from one region (or latitude) to another would be very materially curtailed.

We now come, *in the third place*, to a very interesting topic, but which want of space compels us to treat with unworthy brevity. It is as to *the Indirect Influence of Civilised Man on the Distribution of Plants*. We leave his *direct* influence entirely out of the question. The enormous preponderance of food-producing species, such as cereals, fruit-trees, etc., artificially propagated by man for his own purposes, is not the topic which engages our attention. The phenomenon to which we point is the intimate connection that is traceable between human beings and weeds—between the manipulation of the soil by human hands, and the

* As instances of the narrow limits within which the habitats of some plants appear to be circumscribed, quite irrespectively of mere climatic conditions, may be quoted—*Wellingtonia gigantea*, so sparsely distributed in a few small spots in California that all the individuals now existing there may easily be counted; *Abies Cephalonica*, only found as an indigenous plant in the small island of Cephalonia; *Diza grandiflora*, an orchid nowhere occurring except on the Table Mountain, Cape of Good Hope; *Erica arborea*, exclusively confined to the island of Madeira—*cum multis aliis*. The question of "Centres of dissemination" is, however, so indirectly connected with that immediately before us, that these remarks are entitled to a place in a note only, not in the text.

spontaneous, unwished-for, and profuse appearance of certain plants, each affecting some particular branch of man's labours. How is it that certain species persistently follow the footsteps and artificial operations of man, and abound where he treads, whilst they are comparatively rare elsewhere? It is not that he contributes to their culture, for most of them are noxious weeds, which he does his best to extirpate. But in vain. They cling to him, they dodge him, and defy his efforts to exterminate them. In wild and uncultivated districts the sharp eye of the botanist can scarcely discover a stray specimen of them here and there; but in fields and gardens, on roofs and walls, around human habitations, and generally over the area of man's handiwork, they run riot. For instance—in gardens, *Senecio vulgaris* (grousel), *Stellaria media* (chickweed), and several varieties of *Chenopodium* (goosefoot), *Veronica* (speedwell), and *Euphorbia* (spurge), are everywhere found. In corn-fields, *Sinapis arvensis* (charlock), *Papaver Rhæas* (poppy), *Agrostemma Githago* (corn-cockle), *Viola tricolor* (heartsease), *Spergula arvensis* (corn-spurrey), *Scandix pecten-veneris* (shepherd's needle). In grass-fields, *Bellis perennis* (daisy), *Rumex acetosella* (sorrel), species of *Ranunculus* (crowfoot), and various *Compositæ*. On the tops and sides of walls, *Parietaria* (pellitory), *Asplenium rutamuraria* (wall-rue), *Linaria cymbalaria* (toad-flax), etc. In roads (even the most frequented and dustiest), *Plantago major* (plantain), *Potentilla anserina* (silver-weed), (one of the most widely diffused of species), *Sisymbrium officinale* (hedge-mustard), *Poa annua* (meadow-grass), etc. On roofs, *Sedums* (stonecrop), and *Sempervivum tectorum* (house-leek). In the immediate vicinity of buildings, *Lamium purpureum* (dead-nettle), and *Urtica dioica* (the common nettle), whose presence almost infallibly indicates that not far off a house or shed exists or has existed.

Of corresponding interest and suggestiveness are the

circumstances that attend upon men's operations upon the soil in other ways, such as—1st, Cutting down forests; 2d, Excavating the soil as in railway cuttings, etc.); 3d, Destroying the natural growth of a tract of land by fire. Space will not allow details indicative of all the unexpected changes in vegetation which result from human agency on the surface of the soil. It is sufficient to state that in the three cases specified, the plants that afterwards spring spontaneously from the soil (relieved from the growth it had antecedently borne) are in general quite different from those growing there before; and indeed, in most cases, different from any that had been known to grow in the immediate vicinity. To take one single instance, land cleared of vegetation by the agency of fire will the next season (if left to itself) be, in most cases, abundantly covered by a well-known moss called the *Funaria hygrometrica*, of which probably no plant had existed near there previously to the fire. What is this mysterious connection between the moss and the fire? Are we to suppose that countless millions of the spores of the *Funaria* everlastingly float over millions of square miles, waiting for a fire to find a *nidus* (or fit growing-place)? If so, what are we to say of the numberless spores of the barely numberable species of Ferns and Fungi, incalculably more multitudinous still? The subject cannot be continued, but it must be allowed that it is fertile in suggestive topics.

From a general view of the numerous cross-laws which modify the influence of mere latitude, we may, in great measure, account for the great diversity of plants, from a great diversity of countries, and under a great diversity of local influences, which we, the inhabitants of Great Britain, are privileged to see thriving in our gardens and plantations. A happy circumstance!—hitherto utilised only to an inadequate extent, but from which we ought, in justice to the opportunity and in gratitude for the gift, to secure all the contingent advantages.

CLASSIFICATION INTO NATURAL ORDERS.

343

Genera.		Species.
33	(Brought forward)	67
	Caprifoliaceæ— <i>continued.</i>	
	Sambucus	1
	Symphoricarpus	1
	Viburnum	6
	Weigelia	2
		— 19
2	Celastraceæ	
	Euonymus	5
	Staphylea	2
		— 7
3	Chenopodiaceæ	
	Atriplex	1
	Chenopodium	1
	Diotis	1
		— 3
2	Cistaceæ	
	Cistus	3
	Helianthemum	5
		— 8
5	Compositæ	
	Artemisia	1
	Baccharis	1
	Cineraria	1
	Eurybia	1
	Santolina	1
		— 5
25	Coniferae	
	Abies	17
	Araucaria	1
	Biota	2
	Cedrus	3
	Cephalotaxus	1
	Chamaecyparis	1
	Cryptomeria	2
	Cunninghamia	1
	Cupressus	5
	Dacrydium	1
	Glyptostrobus	1
	Juniperus	11
	Larix	2
	Libocedrus	1
	Pinus	21
	Podocarpus	3
	Pseudolarix	1
	Retinospora	4
	Sciadopitys	1
	Sequoia	1
	Taxodium	2
	Thuiopsis	2
	Thuja	4
		—
70	(Carry forward)	109

Genera.		Species.
70	(Brought forward)	109
	Coniferæ— <i>continued</i> .	
	Torreya	1
	Wellingtonia	1
		— 90
3	Cornaceæ	
	Benthamia	1
	Cornus	3
	Griselinia	2
		— 6
6	Corylaceæ	
	Carpinus	2
	Castanea	2
	Corylus	2
	Fagus	4
	Ostrya	1
	Quercus	22
		— 33
2	Cruciferae	
	Iberis	1
	Vella	1
		— 2
1	Ebenaceæ	
	Diospyros	2
		— 2
3	Elæagnaceæ	
	Elæagnus	4
	Hippophaë	1
	Shepherdia	1
		— 6
2	Empetraceæ	
	Corema	1
	Empetrum	1
		— 2
25	Ericaceæ	
	Ammyrsine	1
	Andromeda	2
	Arbutus	3
	Arctostaphylos	1
	Azalea	4
	Calluna	1
	Cassandra	1
	Cassiope	1
	Clethra	2
	Dabæcia	1
	Epigæa	1
	Erica	8
	Gaultheria	2
	Kalmia	2
	Ledum	1
	Leucothoë	1
	Lyonia	2
	Menziesia	1
112	(Carry forward)	250

CLASSIFICATION INTO NATURAL ORDERS.

345

Genera.		Species.
112	(Brought forward)	250
	<i>Ericaceæ—continued.</i>	
	Oxycoccus	1
	Pernettya	1
	Phyllococe	1
	Rhododendron	8
	Rhodora	1
	Vaccinium	2
	Zenobia	1
		— 50
2	Escalloniaceæ Escallonia	4
	Itea	1
		— 5
1	Euphorbiaceæ Buxus	2
		— 2
1	Garryaceæ Garrya	2
		— 2
1	Gentianaceæ Desfontainea	1
		— 1
1	Gnetaceæ Ephedra	1
		— 1
1	Gramineæ Bambusa	1
		— 1
1	Granataceæ Punica	1
		— 1
1	Grossulariaceæ Ribes	4
		— 4
2	Hamamelidaceæ Fothergilla	1
	Hamamelis	1
		— 2
2	Hypericaceæ Androsæmum	1
	Hypericum	3
		— 4
1	Jasminaceæ Jasminum	4
		— 4
3	Juglandaceæ Carya	4
	Juglans	3
	Pterocarya	1
		— 8
2	Labiatae Lavandula	1
	Phlomis	1
		— 2
2	Lardizabalaceæ Akebia	1
	Lardizabala	1
		— 2
133	(Carry forward)	339

346 CLASSIFICATION INTO NATURAL ORDERS.

Genera.	(Brought forward)	Species.
133		339
2 Lauraceæ	Laurus	3
	Oreodaphne	1
		— 4
24 Leguminosæ	Acacia	3
	Adenocarpus	1
	Amorpha	2
	Anthyllis	1
	Astragalus	1
	Calophaca	1
	Caragana	3
	Cercis	1
	Colutea	1
	Coronilla	1
	Cytisus	6
	Desmodium	1
	Genista	3
	Gleditschia	3
	Gymnocladus	1
	Halimodendron	1
	Indigofera	1
	Ononis	1
	Piptanthus	1
	Robinia	3
	Sophora	1
	Spartium	1
	Virgilia	1
	Wistaria	1
		— 40
2 Liliaceæ	Ruscus	2
	Yucca	3
		— 5
2 Loranthaceæ	Aucuba	1
	Viscum	1
		— 2
3 Magnoliaceæ	Illicium	2
	Liriodendron	1
	Magnolia	8
		— 11
1 Malpighiaceæ	Nitraria	1
		— 1
1 Malvaceæ	Hibiscus	1
		— 1
1 Menispermaceæ	Menispermum	1
		— 1
<hr/> 169	(Carry forward)	<hr/> 404

Genera.		Species.
202	(Brought forward)	452
	Rhamnaceæ— <i>continued.</i>	
	Paliurus	1
	Rhamnus	3
		— 8
18	Rosaceæ	
	Amelanchier	1
	Amygdalus	4
	Armeniaca	1
	Cerasus	8
	Cotoneaster	3
	Crataegus	13
	Cydonia	2
	Exochordia	1
	Kerria	1
	Mespilus	1
	Photinia	1
	Potentilla	1
	Prunus	2
	Pyrus	6
	Raphiolepis	1
	Rosa	4
	Rubus	3
	Spiræa	9
		— 62
2	Rubiaceæ	
	Cephalanthus	1
	Serissa	1
		— 2
1	Rutaceæ	
	Ruta	1
		— 1
2	Salicaceæ	
	Populus	10
	Salix	11
		— 21
1	Santalaceæ	
	Nyssa	1
		— 1
3	Sapindaceæ	
	Æsculus	3
	Kölreuteria	1
	Pavia	4
		— 8
1	Sapotaceæ	
	Bumelia	1
		— 1
1	Saxifragaceæ	
	Hydrangea	4
		— 4
3	Scrophulariaceæ	
	Buddlea	1
	Paulownia	1
	Veronica	2
		— 4
234	(Carry forward)	564

CLASSIFICATION INTO NATURAL ORDERS.

349

Genera.		Species.
234	(Brought forward)	564
1	Smilacæ . . . Smilax . . .	2
		— 2
3	Solanacæ . . . Grabowskia . . .	1
	Lycium . . .	1
	Solanum . . .	1
		— 3
2	Styracæ . . . Halesia . . .	2
	Styrax . . .	1
		— 3
2	Tamaricacæ . . . Myricaria . . .	1
	Tamarix . . .	1
		— 2
2	Taxacæ . . . Salisburia . . .	1
	Taxus . . .	2
		— 3
5	Ternströmiacæ . . . Camellia . . .	1
	Gordonia . . .	1
	Malachodendron . . .	1
	Stuartia . . .	1
	Thea . . .	1
		— 5
2	Thymelæacæ . . . Daphne . . .	6
	Dirca . . .	1
		— 7
2	Tiliacæ . . . Aristotelia . . .	1
	Tilia . . .	3
		— 4
3	Ulmacæ . . . Celtis . . .	3
	Planera . . .	2
	Ulmus . . .	6
		— 11
1	Umbelliferæ . . . Bupleurum . . .	1
		— 1
5	Urticacæ . . . Borya . . .	1
	Broussonetia . . .	1
	Ficus . . .	1
	Maclura . . .	1
	Morus . . .	3
		— 7
2	Verbenacæ . . . Aloysia . . .	1
	Vitex . . .	1
		— 2
264	(Carry forward)	614

Genera.	(Brought forward)	Species.
264		614
2 Vitaceæ	Ampelopsis	2
	Vitis	2
		— 4
3 Xanthoxylaceæ	Ailantus	1
	Ptelea	1
	Xanthoxylum	1
		— 3
<hr/>		
269 Genera	(Total)	Species 621

The 621 species, therefore, represent 84 natural orders, but their distribution is very irregular. The three orders—Coniferæ, Ericaceæ, and Rosaceæ—alone contain together 202 species, or nearly one-third of the whole; whilst there are 21 natural orders which only contribute one species each. Of these 21 orders, 3 are limited to one or two genera each, 5 consist principally of herbaceous plants, and 13 are almost exclusively composed of genera that will only grow in warm climates.

CHAPTER ELEVENTH.

FINE COLLECTIONS OF TREES AND SHRUBS IN VARIOUS PARTS OF THE UNITED KINGDOM.

THROUGHOUT the length and breadth of the land, England is studded with beautiful country residences, ranging from the neat villa to the palatial mansion, all of them environed by pleasure grounds or parks, some a few acres, and others many hundreds, in extent. There are few spots throughout the United Kingdom, from which may not be discerned some family seat, nestling in the valley or enthroned on the mountain-side, peeping from amidst flourishing plantations, carpeted round by an ever-verdant lawn, and communicating with the outer world by an avenue of stately trees. The number of these is still on the increase. Many date from olden times, and for generations have been maintained or improved by their successive owners. Others are of more recent origin, and hardly a year passes without some springing up to satisfy the fresh requirements of newly formed tastes, or of newly acquired wealth.

The gardens, pleasure grounds, or parks, attached to these residences, are rife with arboricultural beauties of various kinds. Many are distinguished for fine specimens of old and large forest trees, whilst some are remarkable for collections of rare and recently introduced species. An arboretum or pinetum which has been kept stocked with new species of trees as they have from time to time been introduced into this country, is an ever increasing source of pleasure and instruction. It is in such collections that the earliest planted, and therefore largest grown specimens of foreign trees are to

be found ; and they afford the means, by watching their yearly growth and development, of judging of their comparative merits, either for utility or ornament, and of their adaptability to our climate. A fine old oak is indeed a goodly sight, but to meet with such no pilgrimage to any particular spot is required. A tall and well-grown *Araucaria* is also a goodly sight, but in how few places can we find one planted thirty or forty years ago ! Let us therefore award due praise to those who have, at the earliest opportunity, adorned their grounds with choice and rare plants ; and still greater praise to those liberal owners of such grounds, who, by throwing them open to public inspection, enable others to participate in the pleasure and improvement which such sights afford.

Under the influence of these considerations, it is thought that it would not be out of place in this work to give a list of the most remarkable collections of fine and choice trees, scattered throughout the United Kingdom, for the benefit of those who might feel the desire, and enjoy the opportunity of visiting them. It is not intended to include therein the numberless places which are adorned by beautiful gardens, or by fine forest trees of the commoner sorts, for otherwise the catalogue would swell into unwieldy dimensions. The list is meant to be restricted to such collections as are distinguished by some speciality—a well assorted and well grown arboretum or pinetum—a numerous assemblage of the newer and rarer species, etc.

No doubt, the list here given is far from complete, and many collections worthy of being commemorated have probably been overlooked. But it may serve as a nucleus to attract further information ; and, by that means, not only the number may be increased of places deserving of a visit, but a more definite knowledge of the special features of each may be obtained.

In the extensive and well-stocked grounds of our leading

nurserymen there are to be found magnificent, and in some cases nearly unique, specimens of the choicest and rarest trees, etc., of recent introduction. Indeed, few sights can afford more interest to a lover of plants than a visit to some of those noble establishments, for in them are to be seen all the finest species in their various stages of growth, and generally in the best health and form. Many a mercantile firm of eminence has a smaller capital embarked in its operations than is invested in these large plant-farms; and no small amount of technical and even scientific knowledge is required for their successful management. In our country, the combination of skill and capital needed for such enterprises has not been wanting, and nowhere has the horticultural art attained greater perfection and development.

But, numerous as are the species cultivated in our best nursery-grounds, they are, with rare exceptions, not allowed to grow into old or large specimens; and for that and other obvious reasons, such collections are excluded from the following list.

LIST 39.

LIST OF FINE COLLECTIONS OF TREES AND SHRUBS
IN VARIOUS PARTS OF THE UNITED KINGDOM.

ENGLAND.

BEDFORDSHIRE.

FLITWICH HOUSE—*Mrs. Brooks*—Amphill. Arboretum and Pinetum. Good collection of recently-introduced trees.

SOUTHILL PARK—*W. H. Whitbread, Esq.*—Biggleswade. Collection of recently-introduced Coniferæ.

THE HEATH—*J. D. Bassett, Esq.*—Leighton Buzzard. A collection of Coniferæ, planted twenty-five years ago.

WOBURN ABBEY—*Duke of Bedford*—Woburn. Salicetum; fine Coniferæ; and extensive general collection.

BERKSHIRE.

BEARWOOD—*John Walter, Esq.*—Wokingham. General collection of fine trees.

WINDSOR CASTLE—*Her Majesty the Queen*. Fine old forest trees, with new and choice plantations at Frogmore.

BUCKINGHAMSHIRE.

CLIVEDEN—*Duchess of Sutherland*—Maidenhead. General collection of trees and shrubs.

DROPMORE—*Hon. G. M. Fortescue*—Maidenhead. Exceptionally fine specimens of several of the Conifers introduced the last half-century, especially of *Araucaria imbricata*—the tallest and finest in Europe; *Abies nobilis*, *Douglasii*, *Smithiana*, *Pinus insignis*, *Laricio*, etc.

CHESHIRE.

EATON HALL—*Marquis of Westminster*—Chester. Pinetum.
General collection of trees and shrubs.

CORNWALL.

CARCLEW—*Captain Tremayne*—Penryn. The late Sir C. Lemon, Bart., began to form at an early period a choice collection of exotic trees and shrubs, chiefly coniferous or evergreen. Favoured by the climate, many of them have attained exceptional size and beauty. Rhododendrons abundant. R. Arboreum is here really a tree. Fine specimens of Lucombe oak (named after a gardener here). *Quercus suber*, etc. etc.

DERBYSHIRE.

CHATSWORTH—*Duke of Devonshire*—Chesterfield. Justly renowned for its greenhouse and stove collections. Some fine specimens of choice hardy trees.

DERBY. Arboretum, founded by J. Strutt, laid out by J. C. Loudon.

ELVASTON CASTLE—*Earl of Harrington*—Derby. Many large transplanted trees. Fine collection of Conifers, and of other trees and shrubs, both evergreen and deciduous.

DEVONSHIRE.

BICTON—*Lady Rolle*—Budleigh Salterton. One of the finest collections in England of choice and newly-introduced Conifers and other trees, but inaccessible to any but the owner.

ENDSLEIGH COTTAGE—*Duke of Bedford*—Tavistock. Rich collection of coniferous and other trees, beneath the shade of which millions of Rhododendrons flourish and multiply.

LUSCOMBE PARK—*P. R. Hoare, Esq.*—Dawlish. General collection of fine trees.

MOUNT EDGECOMBE—*Earl Mount Edgcumbe*—Plymouth. General collection of fine trees. Very large red cedar (*Juniperus Virginiana*).

GLOUCESTERSHIRE.

HIGHNAM COURT—*T. Gambier Parry, Esq.*—Gloucester. Extensive collection comprising fine specimens of the rarer Coniferæ.

HAMPSHIRE.

BASING PARK—*Wm. Nicholson, Esq.*—Alton. Fine avenue (one mile in length) of Deodars and Araucarias, and other handsome trees.

BISHOPSTOKE—*Late Dean of Winchester*—Winchester. General collection of trees, Pines, and other Coniferæ, and shrubs.

HIGHCLERE—*Earl of Carnarvon*—Newbury. Fine old trees, and many of the choicest new species.

LEIGH PARK, HAVANT.—*W. H. Stone, Esq.* Fine gardens and hot-houses. Collection of Coniferæ and fine Hollies, planted by the late Sir George Staunton.

OSBORNE—*Her Majesty the Queen*—Ryde, Isle of Wight. An extensive and choice collection of Conifers planted by the late Prince Consort.

STRATHFIELDSAYE—*Duke of Wellington*—Winchfield. Many fine old trees, and specially a noble avenue of Elms.

HERTFORDSHIRE.

BAYFORDBURY—*W. R. Baker, Esq.*—Hertford. Fine garden, Pinetum, and some choice trees.

ESSENDON PLACE—*Baron Dimsdale*—Essendon. A very fine Pinetum and well-grown avenue of Deodar Cedars.

HATFIELD PARK—*Marquis of Salisbury*—Hatfield. An extensive Pinetum, which, having been one of the earliest planted in England, contains many fine specimens of great size; amongst others an *Abies pinsapo* nearly 50 feet in height.

POLES—*Robert Hanbury, Esq.*—Ware. Numerous Coniferæ and fine Cedars, 50 feet in height.

KENT.

BEDGEBURY PARK—*Alex. Beresford Hope, Esq.*—Cranbrook. A finely-situated Pinetum, of recent origin, but promising.

CHIPSTEAD PLACE—*Perkins, Esq.*—Sevenoaks. Good collection of choice trees, Pines, and shrubs.

COBHAM HALL—*Earl of Darnley*—Gravesend. Fine old specimens of forest and other trees.

LINTON PARK—*Viscount Holmsdale*—Staplehurst. Very fine Coniferæ. *Cryptomeria Japonica*, 37 feet. *Cupressus macrocarpa*, 40 feet. *Pinus insignis*, 50 feet. *Pinus ponderosa*, 41 feet, etc.

REDLEAF—*W. Wells, Esq.*—Penshurst. General collection of trees and shrubs.

LANCASHIRE.

LATHOM HOUSE—*Lord Skelmersdale*—Ormskirk. Fine general collection. Portugal laurel, 26 feet high, by 36 in diameter. *Fagus S. asplenifolia*, 40 feet, etc.

LIVERPOOL BOTANIC GARDEN—*Curator, J. Tyerman*. Large collection of choice trees and shrubs.

WORSLEY HALL—*Earl of Ellesmere*—Manchester. Good general collection.

LEICESTERSHIRE.

BELVOIR CASTLE—*Duke of Rutland*—Grantham. Fine collection of old, new, and choice trees.

DONNINGTON PARK—*Late Marquis of Hastings*—Loughborough. General collection of fine trees.

MIDDLESEX.

ALEXANDRA PARK — *Curator, A. McKenzie* — Muswell Hill. Good collection of choice shrubs and trees, but too recently planted to contain specimens of any size.

BUSHY PARK — *The Crown* — Teddington. Some fine trees, but specially the long avenue of Horse-chestnuts, which, when in blossom, offer a magnificent *coup d'œil*.

CHISWICK HOUSE — *Duke of Devonshire* — Chiswick. General collection of trees and shrubs.

FULHAM PALACE — *Bishop of London*. Trees planted by Bishop Compton. Some first introduced by him into this country. Fine *Juglans nigra*, *Quercus suber*, etc.

PURSER'S CROSS—*Lord Ravensworth*—Fulham. Old specimens of the rarer forest trees often referred to by Loudon—*Juglans nigra*, *Taxodium distichum*, etc.

SION HOUSE—*Duke of Northumberland*—Isleworth. Celebrated for, and abounding in, large specimens of rare and choice trees—*Deodars*, *Deciduous Cypress*, etc.

STANMORE PRIORY—*Kelk, Esq.* *Firs*, *Hemlock Spruce*, *Deciduous Cypress*, etc.

NORTHAMPTONSHIRE

WELTON PLACE—*Major Trevor Clarke*. Fine *Coniferæ*, *Araucarias*, *Cryptomerias*, *Taxodiums*, etc., flourishing in hollows near water.

NORTHUMBERLAND.

BELSAY CASTLE—*Sir C. Monk, Bart.*—Newcastle. Fine old trees, and some good choice *Coniferæ*, particularly a large *Araucaria imbricata*.

WHITFIELD HALL—*Mrs. Ord*—Hexham. Some fine old trees, and very good specimens of the rarer *Coniferæ*.

NOTTINGHAMSHIRE

CLUMBER—*Duke of Newcastle*—Worksop. General collection of fine old trees.

WELBECK ABBEY—*Duke of Portland*—Worksop. Good general collection.

OXFORDSHIRE.

BLenheim—*Duke of Marlborough*—Woodstock. Fine specimens of forest trees and of various shrubs.

WROXTON ABBEY—*Colonel North*—Banbury. An old and curious garden, rich in cut yews and other topiary work.

STAFFORDSHIRE

ALTON TOWERS—*Earl of Shrewsbury*—Cheadle. An interesting specimen of the artificial style of gardening, containing many well-grown and well-trained trees and shrubs.

BIDDULPH GRANGE—*James Bateman, Esq.*—Congleton. Plantations of Coniferous and other trees, including all the choicest novelties.

DRAYTON MANOR—*Sir Robert Peel, Bart.*—Tamworth. Large collection of trees and shrubs. Fine avenues, specially of Limes.

ENVILLE HALL—*Earl of Stamford*—Stourbridge. Magnificent Deciduous trees, planted in groups ; and choice Coniferæ.

KEELE HALL—*Ralph Sneyd, Esq.*—Newcastle. Many fine trees, and a remarkable Holly hedge, 500 yards long, very high and very wide.

SOMERFORD HALL—*A. P. Lonsdale, Esq.*—Brewood. General collection of trees and shrubs.

TRENTHAM HALL—*Duke of Sutherland*—Stoke-on-Trent. Fine garden and numerous trees and shrubs of great beauty.

SUFFOLK.

BURY BOTANIC GARDEN—*Curator, Robert Pettit.* Interesting collection of shrubs and trees.

SHRUBLAND PARK—*Sir G. B. Middleton Broke, Bart.*—Ipswich. Chiefly noted for its fine flower-garden, but adorned with many well-grown and choice trees and shrubs.

SURREY.

BURY HILL—*A. K. Barclay, Esq.*—Dorking. Numerous general collection, rich in Conifers. Fine *Abies Webbiana*.

CRYSTAL PALACE, Sydenham.—The plantations contain many interesting trees, some of which are rapidly growing into fine specimens.

DEEPDENE—*Mrs. Hope*—Dorking. General collection of trees and shrubs.

HEATHERSIDE—*A. Mongredien, Esq.*—Bagshot. Numerous collection of trees and shrubs, including 550 of the species

described in this volume ; and an avenue of *Wellingtonias* one mile in length, but all too lately planted and too small to afford any interest at present, except to a botanist.

KEW GARDENS.—Modern Pinetum. Fine collection of trees and shrubs, and amongst them some large and well-grown specimens of rare species.

OCKHAM PARK.—*Dr. S. Lushington*—Ripley. General collection of trees and shrubs.

PAIN'S HILL.—*W. H. Cooper, Esq.*—Cobham. Several large specimens of the rarer species of trees. A circle of huge Cedars.

SUSSEX.

BEAUPORT.—*Sir C. Lamb*—Hastings. A good general collection and some fine old trees.

STANSTED PARK.—*Mrs. Dixon*—Emsworth. An interesting old garden, with some curious specimens of evergreen shrubs.

WARWICKSHIRE.

COMBE ABBEY.—*Earl of Craven*—Coventry. General collection of trees and shrubs.

WESTMORELAND.

LEVENS HALL.—*Hon. Mrs. Howard*—Milnthorpe. Very old garden, affording many admirable specimens of evergreen shrubs clipped into fantastic shapes, and of the achievements of the old topiary artists.

LOWTHER CASTLE.—*Earl of Lonsdale*—Penrith. Extensive plantations of choice specimen trees.

WILTSHIRE.

LONGLEAT.—*Marquis of Bath*—Warminster. Fine collection of trees and shrubs, and remarkable specimens of rare trees.

WARDOUR CASTLE.—*Lord Arundel*—Tisbury. General collection of choice trees and shrubs.

WILTON HOUSE—*Earl of Pembroke*—Salisbury. Grounds adorned by numerous Conifers, fine Cedars, etc.

YORKSHIRE.

DUNCOMBE PARK—*Lord Feversham*—Helmsley. Good general collection of trees and shrubs.

HULL BOTANIC GARDEN—*Curator, J. C. Niven*—General collection of trees and shrubs.

STUDLEY ROYAL—*Earl de Grey and Ripon*—Ripon. Large specimens of various trees planted in 1720. *Abies excelsa*, 126 feet high; *Abies Canadensis*, 70 feet high and 8 feet in circumference, etc. etc.

WENTWORTH—*Earl Fitzwilliam*—Rotherham. Numerous fine specimens of Coniferous and Deciduous trees.

WALES.

BODORGAN—*Fuller Meyrick, Esq.*—Anglesey. Collection of Conifers thriving near the sea. Some fine specimens of *Abies picea* and *Araucaria imbricata*.

SCOTLAND.

ABERDEEN.

HADDO HOUSE—*Earl of Aberdeen*—Methlick. Fine specimens of Larches and Firs, and also of some of the rarer species recently introduced.

ARGYLE.

INVERARY CASTLE—*Duke of Argyll*—Inverary. Extensive and thriving plantations of the ordinary Conifers, but studded with many specimens of the choicer species.

BANFF.

BALLINDALLOCH CASTLE—*Sir J. M'Pherson Grant, Bart.*—Ballindalloch. Fine grounds on the banks of the Spey, tastefully planted with thriving Conifers.

DUMBARTON.

ROSENEATH—*Duke of Argyll*—Dumbarton. Fine plantations on a beautiful site, interspersed with specimens of rare species.

DUMFRIES.

DRUMLANRIG CASTLE—*Duke of Buccleuch*—Thornhill. Numerous fine trees, especially of the Coniferous family.

EDINBURGH.

DALKEITH PARK—*Duke of Buccleuch*—Dalkeith. Many noble trees, especially some very fine Cedars.

EDINBURGH BOTANIC GARDEN—*Curator, Mr. J. M'Nab*. Fine and improving collection of well-grown trees and shrubs; some striking effects in landscape-gardening.

RICCARTON—*Right Hon. Sir W. Gibson-Craig, Bart.*—Edinburgh. A large and well-selected assemblage of all the newest species of Conifera.

FIFE.

RAITH—*Colonel Monroe Ferguson*—Kirkcaldy. Good collection of choice Coniferous trees, and, amongst others, one of the finest specimens of *Abies Douglasii* in Scotland.

FORFAR.

CRAIGO—*Thomas Macpherson Grant, Esq.*—Montrose. An interesting collection of choice evergreens and Coniferous trees.

KINCARDINE.

DURRIS—*W. T. MacTear, Esq.*—Stonehaven. An extensive collection of choice Conifera, especially of the Japanese genera,

Retinospora, Thuiopsis, etc. A fine specimen of *Abies Douglasii*, 50 feet high, planted in 1840.

LINLITHGOW.

CARLOWRIE—*R. Hutchison, Esq.*—Kirkliston.—A good collection, rich in species of new and choice trees and shrubs.

HOPETOUN HOUSE—*Earl of Hopetoun*—Queensferry. Large collection of trees and shrubs, including fine specimens of some of the species.

MORAY.

DALVEY—*Norman M'Leod, Esq.*—Forres. An interesting collection of Coniferous trees, well selected, and attended to with special care.

GORDON CASTLE—*Duke of Richmond*—Fochabers. General collection of trees and shrubs, especially rich in Conifers.

PEEBLES.

DAWICK—*Sir John Nasmyth, Bart.*—Stobo. Fine general collection, chiefly consisting of Conifers planted in a very picturesque situation.

PERTH.

DRUMMOND CASTLE—*Lord Willoughby d'Eresby*—Crieff. Beautiful gardens and some very fine trees, particularly Silver Firs.

DUNKELD HOUSE—*Duke of Athol*—Dunkeld. Extensive forests of various species of Conifers, especially rich in magnificent specimens of Larch, of which the earliest plantations were made on these estates.

FINGASK—*Sir Peter M. Thriepland, Bart.*—Errol. Good collection of choice trees, mostly Conifers, including the most recent introductions.

KEIR—*Sir William Stirling-Maxwell, Bart.*—Dunblane. Collection of recently-introduced Conifers. Avenues of Wellingtonia, Araucaria, and Cedrus Deodara.

MURTHLY CASTLE—*Sir William Stewart, Bart.*—Dunkeld.

General collection of thriving trees, both Deciduous and Coniferous. Wellingtonia, planted twelve years ago, has attained 21 feet in height; and an *Abies Douglasii*, twenty-two years old, 50 feet.

ROSSIE PRIORY—*Lord Kinnaird*—Inchture. Numerous Conifers, including some fine specimens of the choicer sorts.

SCONE PALACE—*Earl of Mansfield*—Perth. Good general collection, including fine specimens of recently-introduced Coniferous trees.

WIGTON.

CASTLE KENNEDY—*Earl of Stair*—Stranraer. Equally distinguished for its splendid specimens of ordinary timber trees, and for its large collection of newly-introduced species.

IRELAND.

ANTRIM.

CAVE HILL—*Miss Whillaw*—Belfast. Very fine Conifers, well selected and well grown.

ARMAGH.

DRUMBANAGHER—*Colonel Close*—Loughbrickland. Fine specimens of trees, chiefly Coniferous, and a great variety of species.

GOSFORD CASTLE—*Earl of Gosford*—Market Hill. Good general collection.

CORK.

BESSBOROUGH—*Ebenezer Pike, Esq.*—Cork. Large general collection of trees and shrubs.

CASTLE MARTYR—*Earl of Shannon*—Castle Martyr. One of the finest collections of Conifers in Ireland.

FOATY—*J. Smyth Barry, Esq.*—Carrigtohill. Fine plantations interspersed with choice species.

DONEGAL.

BALLYMACOOL—*J. J. Boyd, Esq.*—Letterkenny. A well-planted demesne, comprising some choice Conifers.

DOWN.

CLANDEBOYE—*Lord Dufferin*—Bangor. Good general collection of thriving trees.

TOLLYMORE PARK—*Earl of Roden*—Castlewellan. General collection of trees and shrubs.

WARINGSTOWN—*Major Waring*—Lurgan. Many good Conifers, and other fine trees.

DUBLIN.

DUBLIN BOTANIC GARDEN—*Director, Mr. D. Moore*. Large collection of choice trees and shrubs. *Abies Smithiana*, 25 feet in height. *A. nobilis*, 25 feet. *A. Nordmanniana*, 20 feet. *Pinus Montezumæ*, 20 feet. *Sequoia sempervirens*, 30 feet, etc. etc.

NUTLEY—*Mrs. Roe*—Dublin. Good general collection of trees and shrubs.

WOODLANDS CASTLE—*Lord Annally*—Clonsilla. Many fine trees, with a good sprinkling of the rarer species.

FERMANAGH.

FLORENCE COURT—*Earl of Enniskillen*—Enniskillen. Fine old specimens of Coniferous trees.

GALWAY.

LOUGH CUTRA CASTLE—*Viscount Gough*—Gort. Good collection of trees, chiefly Coniferous and Evergreen.

KERRY.

KENMARE HOUSE—*Viscount Castlerosse*—Killarney. Many large and thriving evergreen trees.

MUCKBROSS—*Right Hon. H. A. Herbert*—Killarney. Numerous healthy and well-grown evergreen trees and shrubs.

KILDARE.

CARTON PARK—*Duke of Leinster*—Maynooth. Large general collection of fine trees and shrubs.

KILKENNY.

KILKENNY CASTLE—*Marquis of Ormond*—Kilkenny. Fine plantations, comprising some of the most ornamental Coniferæ.

WOODSTOCK PARK—*Right Hon. W. F. Tigue*—Inistioge. Fine collection of choice trees and shrubs, and an avenue of Araucarias which is rapidly assuming a most interesting and imposing aspect.

KING'S COUNTY.

CHARLEVILLE FOREST—*Earl Charleville Bury*—Tullamore. General collection of trees and shrubs.

LIMERICK.

MOUNT SHANNON—*Earl of Clare*—Limerick. Some of the finest Conifers in Ireland, and amongst others, a splendid specimen of the *Pinus insignis*.

MEATH.

HAMWOOD—*C. W. Hamilton, Esq.*—Clonee. Good specimens of various Conifers.

LOUGHCREW—*J. L. W. Naper, Esq.*—Oldcastle. Fine general collection of trees and shrubs.

QUEEN'S COUNTY.

BALLYFINN—*Sir Charles Coote, Bart.*—Mountrath. Many fine trees and shrubs, chiefly Coniferous and Evergreen.

ROSCOMMON.

ROCKINGHAM—*Viscount Lorton*—Boyle. Good collection of Conifers and other choice trees.

TIPPERARY.

MARLFIELD—*J. Bagwell, Esq.*—Clonmel. General collection of trees and shrubs.

TYRONE.

CALEDON PARK—*Earl of Caledon*—Caledon. Many fine trees, both Coniferous and Deciduous.

WATERFORD.

CURRAGHMORE—*Marquis of Waterford*—Portlaw. Fine plantations, including good specimens of forest trees, as well as of recently introduced Conifers.

WEXFORD.

JOHNSTOWN CASTLE—*Earl of Granard*—Wexford. Good collection of trees, and some fine specimens of choice species.

WICKLOW.

COOLLATIN PARK—*Earl Fitzwilliam*—Carnew. Many fine trees, both Deciduous and Coniferous, including some of the rarer kinds.

KILRUDDERY—*Earl of Meath*—Bray. Fine plantations, of which the beauty is enhanced by their picturesque situation, and which include many choice trees and shrubs.

POWERSCOURT—*Viscount Powerscourt*—Enniskerry. Fine collection of Conifers, both of the old kinds and the more recently introduced species, adding to the charms of the delightful surrounding scenery.

CHAPTER TWELFTH.

GLOSSARY OF BOTANICAL TERMS—ADVANTAGES OF USING TECHNICAL TERMS.

As this work is chiefly intended for popular use, the fewest possible scientific or technical terms have been introduced in it. Some readers, to whom the few that have been employed are like an unknown tongue, will probably suggest that it would have been better to have dispensed with them altogether. It may be allowable to answer this objection beforehand by remarking that to discard botanical terminology altogether, would expose the writer to two unpardonable faults—viz. vagueness and prolixity. Botanists use terms which define clearly and in a single word what a paraphrastic description would convey less distinctly and more lengthily. For instance, leaves are frequently egg-shaped in outline; that is, not exactly oval, but a little dilated towards one extremity of the oval and a little narrowed towards the other, the outline corresponding with the “big end” and the “little end” of the egg. Now, some leaves have the broader part towards the stalk and the narrower towards the apex (or top), others present precisely the reverse configuration. It has been settled amongst botanists that the word “ovate” shall represent the first, and “obovate” the second of these shapes. This being once for all agreed and understood, a complex meaning is thus conveyed in a manner which is at once *concise* and *precise*.

Again, compare the definitions furnished in the Glossary of the words Corymb, Panicle, Raceme, Spike, and Umbel, each expressing a different mode in which bunches of flowers

are found to be arranged, and it will be seen that these single words indicate distinctions to convey which by description would necessitate an entire separate phrase for each. Some such saving of time, thought, and labour, results from the use of almost every word in the glossary.

These remarks, superfluous as they may be to regular botanical students, may serve to reconcile the general reader to the adoption of scientific terms (which by many is considered as savouring of pedantry), and furnish him with adequate motives for undergoing the very moderate labour of learning the meaning attached to each technical word. The process simply amounts to a little trouble at first, to save a very great deal afterwards.

GLOSSARY OF SUCH BOTANICAL TERMS AS ARE USED
IN THIS WORK.

ACULEATE : furnished with prickles.

ACUMINATE : gradually tapering to a point.

ACUTE : terminating in a sharp point.

ALTERNATE (leaves) : rising from the stem at various heights.

AMENTUM (or Catkin) : a crowded spike of sessile flowers intermingled with scaly bracts.

ANTHER : that part of the stamen which contains the pollen.

ARTICULATED : jointed, easily separating at some point.

AURICULATED (leaves) : having lobes (called auricles) at the base.

AXIL : the (upper) juncture of the leaf with the stem.

AXILLARY : arising from the axil of a leaf.

BERRY (Bacca) : a pulpy fruit, in which the seeds are embedded.

BIFID : two-cleft.

BIPINNATE (leaves) : doubly pinnate, which occurs when the leaflets of a pinnate leaf are themselves pinnate.

BRACTS : scales or leaf-like appendages to the inflorescence, mostly clothing the points whence the flowers arise.

CALYX : the outer envelope of the flower, or the envelope when there is only one.

- ✓ **CAMPANULATE** : bell-shaped.
- ✓ **CAPSULE** : a dry seed-vessel, opening by valves of various construction and position.
- CATKIN** : see *Amentum*.
- ✓ **CILIATED** : fringed with marginal hairs.
- ✓ **CLAVATE** : club-shaped, gradually thickened upwards from a slender base.
- ✓ **CONE** : a form of *Amentum* (or *Catkin*) in which the seed-bearing scales are large, woody, and persistent, as in the fir tribe.
- ✓ **CORDATE** (leaves) : heart-shaped, with the broad part of the heart next the stalk.
- ✓ **CORIACEOUS** : of a leathery consistence.
- ✓ **COROLLA** : the inner envelope of the flower when there are two envelopes.
- ✓ **CORYMB** : a form of compound inflorescence in which the lower stalks are elongated, and all the flowers come to nearly a level above.
- ✓ **CRENATE** (leaves) : cut into small rounded marginal divisions.
- ✓ **CUNEATE** : wedge-shaped.
- ✓ **DELTOID** (leaves) : of a somewhat triangular shape, like the Greek letter, delta.
- ✓ **DENTATE** (leaves) : toothed, cut into small acute marginal divisions.
- ✓ **DIGITATE** (leaves) : having several leaflets attached at the base to one point.
- DISTICHOUS** : in two rows on opposite sides of a stem.
- DRUPE** : a fleshy fruit containing the stony covering to the seed.
- ELLIPTICAL** : having the form of an ellipse ; nearly the same as oval.
- ENTIRE** : without any marginal divisions.
- EXsertED** : generally applied to stamens protruding beyond the corolla.
- FASTIGIATE** : branches all pointing upwards in a nearly pyramidal or columnar shape.
- FILAMENT** : the stalk supporting the anther, the two together composing the stamen.
- FOLLICLE** : a fruit composed of a single carpel, dehiscing (opening) by one suture.
- ✓ **FUGACIOUS** : falling off or perishing very quickly.
- ✓ **GLABROUS** : smooth, without hairs.
- ✓ **GLANDULAR HAIRS** : hairs tipped with a gland or small pellet.
- ✓ **GLAUCCOUS** : covered with a fine pale or sea-green bloom.

HABIT (of a plant) : the general external appearance.

HIRSUTE : covered with long hairs.

HISPID : covered with long hairs very stiff and harsh.

IMBRICATED : parts overlapping each other like tiles on a house.

LACINIATED : irregularly divided or torn.

LANCEOLATE : an elongated elliptical form tapering at both ends.

LATERAL : fixed on the side and not on the end of a branch or shoot.

LINEAR (leaves) : very narrow as compared with length ; needle-shaped.

LOBE : a segment or division of a leaf, generally on a large scale.

LYRATE (leaves) : having a large terminal lobe, and smaller ones diminishing in size towards the base.

MUCRONATE : abruptly terminating in a stiff sharp point.

OBCORDATE : inversely cordate or heart-shaped, the broad part of the heart at the end of the leaf.

OBLONG : extending more in length than in breadth.

OBOVATE : inversely ovate or egg-shaped, the broad part of the egg at the end of the leaf.

ORBICULAR (leaf) : of circular form, with petiole attached to the centre.

OVAL : elliptical, or having very nearly the form of an ellipse.

OVATE : shaped like an egg, the broad part of the egg at the base of the leaf (near the stalk).

PALMATE (leaves) : having several deeply-cleft lobes, the mid-rib of each radiating from a common point at the base.

PANICLE : a form of compound inflorescence in which the stalks and stalk-bearing branches are of various lengths.

PECTINATE : cut into narrow segments, like the teeth of a comb.

PEDICEL : the stalk of a single flower.

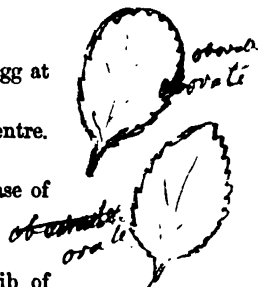
PEDUNCLE : the general flower-stalk.

PELTATE (leaf) : fixed to the stalk (petiole) at the centre, or at some point within the margin.

PERICARP : the covering of the real integuments of the seeds ; that part of the fruit which (when edible) is generally eaten.

PERSISTENT : not falling off ; applied to leaves it means evergreen or nearly so.

PETIOLE : the leaf-stalk.



PHYLLODIUM : a leaf-stalk enlarged so as to have the appearance of a leaf.

PINNA ; the leaflet of a pinnate leaf.

PINNATE : a compound leaf having leaflets arranged on each side of a common petiole.

PINNATIFID : a simple leaf cut almost to the axis into lateral segments.

PINNULE : the small pinna of a bipinnate leaf.

PISTIL : the female organ of the flower ; situated on the ovary, and composed of the style and stigma.

PLENUS : when applied to the flower, means double.

PROCUMBENT : lying on the ground.

PUBESCENT : downy, covered with short and soft hairs.

PULVERULENT : dusty, covered with fine powdery matter.

RACEME : a form of compound inflorescence in which several flowers (on stalks) are borne on a common axis.

REPAND : margins slightly undulated.

REVOLUTE (leaf) : a leaf with its margins (or edges) rolled backwards.

RHIZOME : a prostrate creeping stem, giving off buds above and roots below.

SCABROUS : rough ; covered with stiff, very short hairs.

SECUND : having all the stalks turned to one side of the stem or axis.

SERRATE (leaf) : having sharp teeth pointing towards the apex, like the teeth of a saw.

SERRULATED : finely or diminutively serrate.

SESSILE : not stalked, without peduncle (if a flower), or petiole (if a leaf).

SIMPLE : not divided or branched.

SINUATE (leaf) : having large obtuse indentations in the margin.

SPATHULATE (leaf) : of a linear form enlarging into a wide rounded extremity.

SPIKE : a form of compound inflorescence in which several sessile (unstalked) flowers are borne on a common axis.

STAMEN : the male organ of a flower, consisting of filament (stalk), anther, and pollen.

STIGMA : the upper extremity of the pistil, borne by the style.

STIPULE : leafy appendage at the base, or on the petiole of a leaf.

STRIATED : marked by streaks or longitudinal lines.

STYLE : the stalk supporting the stigma ; the two together composing the pistil.

SUBULATE : acute-pointed and shaped like an awl.

TERNATE (leaf) : composed of three leaflets.

TOMENTOSE : covered with dense, cottony, entangled hairs.

TRIFID : three-cleft.

TRIFOLIATE : same as *Ternate*.

TRUNCATE (leaf) terminating abruptly, as though a piece had been cut off.

UMBEL : a form of compound inflorescence, in which several pedicels proceed from one point and are of equal length.

UMBILICATE : same as *Peltate*.

UNILATERAL : arranged on or turned to one side ; same as *Secund*.

VERTICILLATE : whorled ; parts arranged in a circle round a common axis.

VILLOUS : beset with long soft hairs.

VISCOUS (or *Viscid*) : clammy, glutinous.

WHORLED : same as *Verticillate*.

CHAPTER THIRTEENTH.

INDEX TO THE ENGLISH NAMES OF THE SPECIES—ADVANTAGES OF USING THE BOTANICAL NAMES OF PLANTS.

WITH all due appreciation of the beauty and suggestiveness of some of the English names of plants, the advantages of using (as much as possible) their Latin or botanical names largely predominate. In the first place, English names frequently mislead, by giving to one genus the proper name of another. Thus the Philadelphus is commonly called Syringa, whereas the Syringa really is the Lilac ; the Robinia is called the Acacia, whilst the Acacia is a totally different tree ; the well-known shrub called Laurel is a Cerasus (or cherry), and the term Laurel rightly belongs to the *Laurus nobilis*, which is designated the Bay tree. The two widely-distinct genera Castanea and Æsculus are frequently confounded by both bearing the English appellation of Chestnut, an ambiguity which the division into Spanish Chestnut and Horse Chestnut does not always remove. Of this a curious instance occurs in a recent translation of L. Figuiet's work, *The Vegetable World* (pp. 356 and 357), where the two genera are mixed up in a strange manner. In some cases, where an old erroneous Latin designation had become popularised, and adopted as a vernacular name, it has clung to the popular mind, although long since altered when the error was discovered. Thus the Laurustinus is really the *Viburnum tinus*, the *Althæa frutex* is the *Hibiscus Syriacus*, the *Pyrus Japonica* is the *Cydonia Japonica*, etc.

Secondly, English names are frequently vague and even deceptive. The same plant is named quite differently in different parts of the country, and thus has two, or three, or

more English names, as, for instance, the *Pyrus aucuparia*, which to some is the Quicken-tree, to others the Mountain Ash (though no ash at all), and to not a few the Rowan-tree. It is true that "a rose by any other name will smell as sweet," but if the "other name" were unknown to us, we should not be aware that a rose was meant by it. What creates worse confusion still, is that the same name is applied in different districts to different plants. Thus, in some parts, Sweet William means the *Dianthus barbatus*, and in others the *Silene Armeria*; the designation "Broom" is indiscriminately applied to the genera *Spartium*, *Cytisus*, and *Lygeum*; and, not to multiply instances, that interesting verbal compound Moneywort is appointed to the difficult function of identifying four distinct plants, each belonging to four entirely different genera, viz. *Lysimachia*, *Thymus*, *Hedysarum*, and *Dioscorea*.

Thirdly, the range of usefulness of those works in which English names of plants alone are used is much circumscribed. Many a foreigner, who can fluently read our language, is ignorant of our plant-nomenclature, and on meeting with the words Hornbeam or Spindle-tree, would have no distinct impressions conveyed to him, or might probably receive erroneous ones on coming to the words *Syringa* or Chestnut. French writers are quite as censurable in this respect as our own. Even in works professedly botanical, they too frequently call plants by their French names, and thus render it difficult to all but natives (and probably to many of those) to identify the species they refer to without the tiresome drudgery of consulting a dictionary.

On the other hand, the use of scientific botanical names removes all these difficulties, and dispels all ambiguity as to the identity of the plants designated by the writer or speaker. If we cannot arrive at the object so much coveted and so unsuccessfully attempted by Bishop Wilkins,—a universal language,—we can make some slight advance in that direc-

tion by the universal adoption of the same term to designate the same plant. If, by common agreement, a certain vegetable production is named *Hedera*, why should men unnecessarily confound and perplex each other by calling it, some Ivy, others Lierre, others Epheu, etc. etc.? The Latin language has, naturally and for good reasons, been selected as the common medium of intercommunication between naturalists on scientific topics. It is a dead language, and therefore no longer subject to mutation, either as to words or grammatical forms; it is pretty universally studied at all the schools (at least) of the middle and wealthier classes, so that, amongst well-educated persons, its use presents no great difficulties; and its adoption for scientific nomenclature obviates the jealousy that might be generated by the attempted selection of any particular living language for that purpose.

Moreover, the use of botanical terminology leads by very simple means to a correct knowledge of the affinities between one plant and another. For instance, it is clear that the *Ruscus aculeatus* and the *Ruscus racemosus* must be nearly allied, and the difference between them can only be of a secondary character, viz. as between species and species of the same genus. The English names of those two plants lead to utter confusion. They are respectively Butcher's Broom and Alexandrian Laurel. Now, not only do these names convey no indication of the plants being nearly allied, but on the contrary they expressly announce that the one is a Broom and the other a Laurel, two genera which are very widely distinct from each other, and still more widely distinct from the family of which the *Ruscus* is really a member. Again, the *Juniperus Virginiana* is, *Anglicè*, the Red Cedar, and the *Juniperus Sabina* is the Savin. The English names afford not the least clue to the fact that these are both Junipers, separated by mere specific differences, but actually mislead by enunciating one of them to be a Cedar, which it is not.

As to the uncouthness of Latin names, which is frequently urged as an objection, that is an error which a little experience and a little reflection will easily remove—experience, by proving that a little practice will make Latin names roll glibly on the tongue—and reflection, by pointing out that German or French names are still more unpronounceable than the Latin ones by unpractised English organs. Similarly, our vernacular names must be far more unmanageable by and unintelligible to foreigners than the Latin words proposed in their stead, which form, as it were, a neutral ground on which all nations enjoy an equal footing.

It is therefore strongly recommended to all, even the merest amateurs, to acquire a knowledge of, and to habitually use, the botanical names of plants. The difficulty is slight and temporary, the advantages are signal and permanent.

 INDEX TO THE ENGLISH NAMES.

N.B.—When the corresponding botanical name is that of a genus only, it indicates that the English name represents the greater part of the species of it contained in this work ; but when the botanical specific name is added, it implies that the English name applies only to that particular species.

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Abele tree	<i>Populus alba</i>	202
Acacia	<i>Robinia pseudacacia</i>	219
Adam's needle	<i>Yucca</i>	268
Alder	<i>Alnus</i>	8
Alexandrian laurel	<i>Ruscus racemosus</i>	222
Allspice	<i>Calycanthus</i>	48
Almond	<i>Amygdalus</i>	14
<i>Althæa frutex</i>	<i>Hibiscus</i>	128
American creeper	<i>Ampelopsis hederacea</i>	13
Aniseed tree	<i>Illicium</i>	134
Apricot	<i>Armeniaca</i>	24
Arbor vitæ	<i>Biota</i>	39
Do.	<i>Thuja</i>	249
Ash	<i>Fraxinus</i>	113
Ash berberry	<i>Mahonia</i>	162
Aspen	<i>Populus tremula</i>	202

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Athenian poplar	Populus Græca	202
Bamboo	Bambusa	33
Bastard indigo	Amorpha	12
Bay tree	Laurus nobilis	145
Bearberry	Arctostaphylos	21
Beech	Fagus	108
Berberry	Berberis	36
Birch	Betula	27
Bird cherry	Cerasus padus	62
Birthwort	Aristolochia	22
Black Jack	Quercus nigra	211
Black spruce	Abies nigra	1
Bladder-nut	Staphylea	238
Bladder senna	Colutea	74
Box	Buxus	45
Box elder	Negundo	171
Box thorn	Lycium	158
Bramble	Rubus	221
Buckthorn	Rhamnus	214
Butcher's broom	Ruscus hypoglossum	222
Butter nut	Juglans cinerea	138
Button wood	Cephalanthus	60
Calabrian pine	Pinus Brutia	194
Californian nutmeg	Torreya	251
Candleberry myrtle	Myrica	168
Candytuft	Iberis	132
Cedar	Cedrus	58
Champion oak	Quercus rubra	111
Chaste tree	Vitex	262
Cherry	Cerasus	62
Chestnut (Spanish)	Castanea	55
Chestnut oak	Quercus prinus	211
Christ's thorn	Paliurus	182
Cluster pine	Pinus pinaster	194
Common laurel	Cerasus laurocerasus	62
Cork elm	Ulmus suberosa	253
Cork tree	Quercus suber	211
Cornel tree	Cornus mascula	78
Cornish elm	Ulmus Cornubiensis	253
Corsican pine	Pinus Laricio	194
Cranberry	Oxycoccus	180
Crowberry	Empetrum	99
Cucumber tree	Magnolia acuminata	161
Currant	Ribes	218
Cypress	Cupressus	85
Date plum	Diospyros	95

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Deciduous cypress	Taxodium	244
Deodar	Cedrus Deodara	58
Dogwood	Cornus	78
Eglantine	Rosa rubiginosa	220
Elder	Sambucus	226
Elm	Ulmus	253
English elm	Ulmus campestris	253
Evergreen oak	Quercus Ilex	211
Fan palm	Chamærops	65
Fig	Ficus	109
Fir	Abies	1
Flowering ash	Ornus	177
Fringe tree	Chionanthus	68
Funereal cypress	Cupressus funebris	85
Garland flower	Daphne Cneorum	90
German tamarisk	Myricaria	169
Ginkgo	Salisburia	224
Glastonbury thorn	Cratægus oxyacantha præcox	82
Goat's thorn	Astragalus	27
Goat wheat	Tragopyrum	252
Goat willow	Salix caprea	225
Golden larch	Pseudolarix	206
Goose-foot	Chenopodium	66
Groundsel tree	Baccharis	32
Guelder rose	Viburnum opulus sterile	257
Gum cistus	Cistus Cyprius	70
Hackberry	Celtis crassifolia	59
Hare's ear	Bupleurum	44
Hawthorn	Cratægus oxyacantha	82
Hazel	Corylus Avellana	80
Heath	Erica	102
Heather	Calluna	46
Hemlock spruce	Abies Canadensis	1
Hickory	Carya	52
Holly	Ilex	133
Honey locust	Gleditschia triacanthos	117
Honeysuckle	Lonicera	157
Hop hornbeam	Ostrya	179
Hornbeam	Carpinus	51
Horse chestnut	Æsculus	5
Huntingdon elm	Ulmus glabra	253
Huon pine	Dacrydium	89
Indian hawthorn	Raphiolepis	212
Indigo	Indigofera	135
Irish yew	Taxus baccata fastigiata	245
Ivy	Hedera	126

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Japan cedar	<i>Cryptomeria</i>	83
Jasmine	<i>Jasminum</i>	137
Jerusalem sage	<i>Phlomis</i>	191
Judas tree	<i>Cercis</i>	63
Juniper	<i>Juniperus</i>	139
Kentucky coffee tree	<i>Gymnocladus</i>	122
Kermes oak	<i>Quercus coccifera</i>	211
Kidney vetch	<i>Anthyllis</i>	17
Labrador pine	<i>Pinus Banksiana</i>	194
Laburnum	<i>Cytisus laburnum</i>	87
Larch	<i>Larix</i>	144
Laurel	<i>Cerasus laurocerasus</i>	62
Laurestine	<i>Viburnum tinus</i>	257
Lavender	<i>Lavandula</i>	146
Lavender cotton	<i>Santolina</i>	227
Leatherwood	<i>Dirca</i>	97
Lilac	<i>Syringa</i>	242
Lime	<i>Tilia</i>	250
Ling	<i>Calluna</i>	46
Live oak	<i>Quercus virens</i>	211
Locust tree	<i>Robinia</i>	219
Lombardy poplar	<i>Populus fastigiata</i>	202
Mammoth tree	<i>Wellingtonia</i>	264
Maple	<i>Acer</i>	3
Medlar	<i>Mespilus</i>	166
Milkwort	<i>Polygala</i>	200
Mistletoe	<i>Viscum</i>	260
Mock orange	<i>Philadelphus</i>	189
Moonseed	<i>Menispermum</i>	164
Mountain ash	<i>Pyrus aucuparia</i>	210
Mulberry	<i>Morus</i>	167
Myrtle	<i>Myrtus</i>	170
Necklace-bearing poplar	<i>Populus monilifera</i>	202
Nettle tree	<i>Celtis</i>	59
Nightshade	<i>Solanum</i>	234
Norway maple	<i>Acer platanoides</i>	3
Norway spruce	<i>Abies excelsa</i>	1
Oak	<i>Quercus</i>	211
Olive	<i>Olea</i>	174
Ontario poplar	<i>Populus canadensis</i>	202
Orache	<i>Atriplex</i>	29
Osage orange	<i>Maclura</i>	160
Papaw	<i>Asimina</i>	26
Paper mulberry	<i>Broussonetia</i>	41
Parsley-leaved vine	<i>Vitis vinifera laciniosa</i>	261
Passion flower	<i>Passiflora</i>	184

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Pear	<i>Pyrus</i>	210
Pea tree	<i>Caragana</i>	50
Peony	<i>Pæonia</i>	181
Periwinkle	<i>Vinca</i>	258
Persian lilac	<i>Syringa Persica</i>	242
Persimon	<i>Diospyros Virginiana</i>	95
Pine	<i>Pinus</i>	194
Pistachio	<i>Pistacia</i>	196
Pitch pine	<i>Pinus rigida</i>	194
Plane tree	<i>Platanus</i>	198
Plum	<i>Prunus</i>	205
Pomegranate	<i>Punica</i>	209
Poplar	<i>Populus</i>	202
Portugal laurel	<i>Cerasus Lusitanica</i>	62
Privet	<i>Ligustrum</i>	152
Purple beech	<i>Fagus sylvatica atrovirens</i>	108
<i>Pyrus Japonica</i>	<i>Cydonia Japonica</i>	86
Quince	<i>Cydonia</i>	86
Red cedar	<i>Juniperus Virginiana</i>	139
Red root	<i>Ceanothus</i>	57
Red wood	<i>Sequoia</i>	229
Rest harrow	<i>Ononis</i>	175
Rock rose	<i>Cistus</i>	70
Rose	<i>Rosa</i>	220
Rose bay	<i>Rhododendron</i>	215
Rose willow	<i>Salix helix</i>	225
Rue	<i>Ruta</i>	223
Saint John's wort	<i>Hypericum</i>	131
Saint Peter's wort	<i>Symphoricarpus</i>	241
Salt tree	<i>Halimodendron</i>	124
Sarsaparilla	<i>Smilax Sarsaparilla</i>	233
Sassafras tree	<i>Laurus Sassafras</i>	145
Savin	<i>Juniperus Sabina</i>	139
Scented verbena	<i>Aloysia citriodora</i>	9
Scotch elm	<i>Ulmus montana</i>	253
Scotch fir	<i>Pinus sylvestris</i>	194
Scotch laburnum	<i>Cytisus alpinus</i>	87
Scrub pine	<i>Pinus Banksiana</i>	194
Sea buckthorn	<i>Hippophaë</i>	129
Shrubby cress-rocket	<i>Vella</i>	255
Shrubby horsetail	<i>Ephedra</i>	100
Shrubby trefoil	<i>Ptelea</i>	207
Silver birch	<i>Betula alba</i>	37
Silver fir	<i>Abies picea</i>	1
Snowberry	<i>Symphoricarpus</i>	241
Snowdrop tree	<i>Halesia</i>	123

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Snow-flower	Chionanthus	68
Snowy mespilus	Amelanchier Botryapium	10
Sorrel tree	Lyonia arborea	159
Southernwood	Artemisia	25
Spanish broom	Spartium junceum	236
Spanish chestnut	Castanea	55
Speedwell	Veronica	256
Spindle tree	Euonymus	105
Spruce fir	Abies	1
Spurge laurel	Daphne laureola	90
Stone pine	Pinus pinea	194
Storax	Styrax	240
Strawberry tree	Arbutus	20
Sugar maple	Acer saccharinum	3
Sumach tree	Rhus typhina	217
Sun rose	Helianthemum	127
Sweet briar	Rosa rubiginosa	220
Sycamore	Acer pseudo-platanus	3
Syringa	Philadelphus	189
Tamarisk	Tamarix	243
Tea	Thea	247
Thorn	Crataegus	82
Toothache tree	Xanthoxylum	267
Trumpet flower	Bignonia	38
Do.	Tecoma	246
Trumpet honeysuckle	Lonicera sempervirens	157
Tulip tree	Liriodendron	155
Tupelo tree	Nyssa	173
Turkey oak	Quercus Cerris	211
Tutsan	Androsæmum	16
Umbrella pine	Sciadopytis	228
Umbrella tree	Magnolia tripetala	161
Valonea oak	Quercus Ægilops	211
Vine	Vitis	261
Virgin's bower	Clematis	71
Virginian creeper	Ampelopsis hederacea	13
Walnut	Juglans	138
Water pine	Glyptostrobus	118
Weeping willow	Salix Babylonica	225
Weymouth pine	Pinus Strobus	194
White beam tree	Pyrus Aria	210
White broom	Cytisus albus	87
White cedar	Chamæcyparis	64
White spruce	Abies alba	1
White willow	Salix alba	225
Whortleberry	Vaccinium	254

English Name.	Corresponding Botanical Name.	Serial No. of the Genus.
Wild olive	Elæagnus . . . . .	. 98
Willow	Salix . . . . .	. 225
Willow oak	Quercus phellos . . . . .	. 211
Winter-berry	Prinos . . . . .	. 204
Woodbine	Lonicera periclymenum . . . . .	. 157
Wych elm	Ulmus montana . . . . .	. 253
Wych hazel	Hamamelis . . . . .	. 125
Yellow pine	Pinus mitis 194
Yellow root	Xanthorrhiza 266
Yellow wood	Virgilia 259
Yew	Taxus 245
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